

NeDNR Prepares Real-time Flooding Interactive Map in Response to 2019 Flood Event

By Stefan Schaepe, PE, CFM

The massive flood event that devastated Nebraska in 2019 left technical experts scrambling to produce meaningful flood inundation maps to aid emergency managers. The flooding was so widespread, and the conditions were changing so rapidly, that it made these efforts nearly impossible. Although FEMA regulatory floodplains cover most of the state, they only show specific flooding events, the 1% annual chance event and sometimes the 0.2% annual chance event. These are two static inundation boundaries that do not demonstrate the conditions in a community as a flood passes through. Additionally, the floodplain boundaries, gage data, weather forecast, and critical infrastructure locations are all scattered across a multitude of various websites and databases.

To help State and Local officials, as well as private citizens, prepare for the next disaster, the Nebraska Department of Natural Resources and Nebraska Emergency Management Agency are developing the Nebraska Real-time Flood Forecast (NeRFF) Interactive Map. NeRFF will provide a one-stop platform for emergency managers, community leaders, and the public to view pre-calculated flood inundation boundaries at gage sites, in real time. A user will be able to visit the map, zoom to a participating gage, and will instantly be able to view the flooding extents based on the current gage height. Additionally, if additional flooding is expected, the user will be able to increase the flood

- See [Real-time](#) cont. on page 2.

Silver Jackets Team Releases Mitigation Project Interactive Map

By Jamie Reinke, PE, CFM

As the Silver Jackets Team continues to work with communities throughout the state, a common theme has emerged: many communities don't know where to start when it comes to reducing their risk to natural hazards. The team began searching for ways to help communities identify potential projects, navigate the many funding opportunities, and overcome other challenges associated with completing mitigation projects. This search led to the development of the Mitigation Project Interactive Map.

The Mitigation Project Interactive Map is a compilation of mitigation projects that have been completed throughout the state. The map lists the funding

- See [Silver Jackets](#) cont. on page 3.

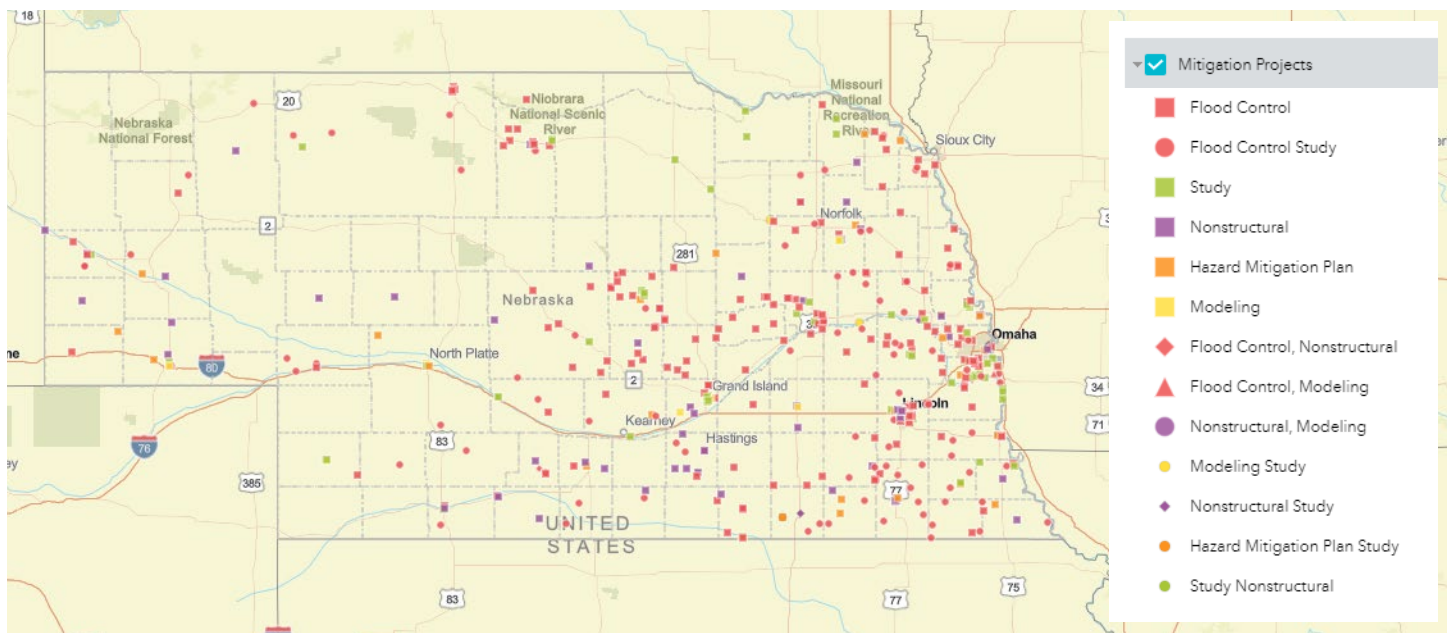


NeDNR engineer, Deanna Ringenberg, speaks passionately about how flood risks can change and how engineering methods evolve to provide the most accurate mapping of flood risks in a hybrid kick-off meeting for the Big Nemaha watershed held on September 7, 2022, at the public library in Tecumseh, NE.

Photo: Asa Brayton, NeDNR.

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The above screen capture shows the different categories of mitigation projects that can be explored through the Silver Jackets mitigation project interactive map.

Appropriate Uses of State Determined BFEs

Real-time cont. from page 1.

By Elijah Kaufman, CFM

stage to visualize how the flooding will develop. This will allow communities and citizens to make informed decisions about the risks flooding poses to their lives and property.

NeDNR is now working to create an extensive network of inundation maps for 47 gage sites, covering 54 communities across the state. These initial 47 sites were selected based on their proximity to an active stream gage, history of flooding, and size of drainage area. For each site, inundation boundaries will be available for every half foot stream stage interval. Current and forecasted stages provided by the National Weather Service will be displayed on the interactive map, allowing users to easily relate forecasted river stages with inundation boundaries. Additional data such as weather radar, dams, levees, and critical infrastructure will also be features of the map. The NeRFF site is scheduled to be launched in the Fall of 2023. Following the 2023 release date, the NeDNR plans to add additional sites to the map to assist communities that are most prone to flooding. ■

For floodplain administrators with Zone A floodplains in their jurisdiction, requesting Base Flood Elevations (BFEs) from the NeDNR Floodplain Management Section is just part of the job. These free, engineer-developed maps show the flood elevations during a 1% Annual Chance Flood, and are primarily used for permitting new developments in the floodplain. But is that all they can be used for? What are the limitations of a state determined BFE?

Refresher on State - Determined BFEs

BFEs from NeDNR show the floodplain boundaries with the addition of flood elevations. These flood elevations are usually shown at 1ft intervals, allowing the floodplain administrator to determine the appropriate elevation for compliance. When a floodplain administrator requests a BFE for a location, BFEs for the entire section will be calculated. Previously requested BFEs are available on our interactive map and visible when the "BFE Determinations" layer is active: <http://ne.gov/go/floodriskmap>.

Please be aware that BFEs can be invalidated at any time and for a number of reasons, so it is important to always check our map to ensure that your section still has a valid BFE determination. BFEs are invalidated after 5 years, when new Preliminary or Effective FIRMs are issued, or when better data becomes available.

When is a BFE Needed?

Zone A floodplains are areas with a 1% annual chance of flooding and are based on the best available elevation data at the time they were created. Because an enhanced study has not been completed in these zones, no flood elevations or BFEs are shown. The only information that floodplain administrators have is the boundary of the floodplain itself. This is not enough information for permitting, as the floodplain administrator, property owner, and contractor do not know what elevation the structure must be built to for compliance. This is when a BFE determination must be requested from NeDNR.

- See BFEs cont. on page 4.

Silver Jackets cont. from page 1.

mechanisms, team partners, hazard addressed, and other project information for mitigation activities going back to the year 2000, or earlier when possible. By compiling the data across the entire state, the map will show that even smaller mitigation activities, occurring throughout a community, watershed, or region, can have noticeable benefits for residents.

The team recognizes that many communities have limited capacity, are unfamiliar with the specific requirements of grants that may be available, and that they need help meeting the local funding match. This map will provide communities with a resource that can highlight successful mitigation projects, provide information on how other jurisdictions have teamed to fund these projects, and get communities and residents focused on the long-term benefits that result from reducing their hazard risks. The initial phase of work is nearly complete, but we hope that it is just one step in the larger effort of implementing risk reduction actions and that it can serve as an example for communities across the nation.

The Mitigation Project Interactive Map showing the projects that have been compiled through this project can be viewed [here](#).

The team compiled information from the following local, state, and federal organizations:

- Little Blue NRD
- Lower Elkhorn NRD
- Lower Loup NRD
- Lower Platte North NRD
- Lower Platte South NRD
- Middle Niobrara NRD
- Nemaha NRD
- Papio-Missouri River NRD
- South Platte NRD
- Twin Platte NRD
- Upper Niobrara White NRD
- U.S. Army Corps of Engineers
- Federal Emergency Management Agency
- U.S. Geological Survey

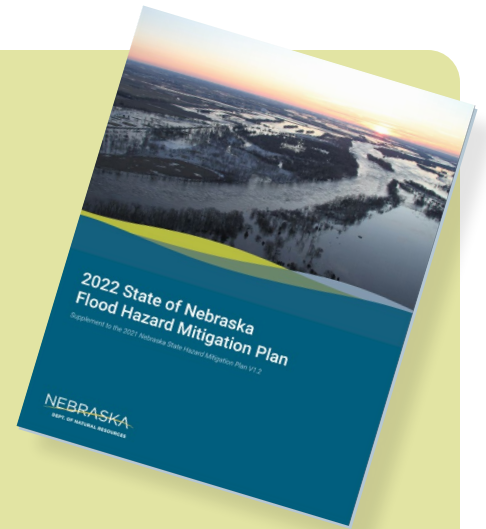
2022 State Flood Hazard Mitigation Plan and You

By Adele Phillips, CFM

On July 1, 2022, NeDNR submitted the 2022 State of Nebraska Flood Hazard Mitigation Plan to the legislature. Updated because of the devastating 2019 floods, this document contains a wealth of information which local communities may use to advance their flood mitigation efforts. The complete plan is available for download here: <https://dnr.nebraska.gov/floodplain/nebraska-flood-hazard-mitigation-plan>

Please use the plan as you consider ways to make your communities more resilient to flood hazards and develop your own local hazard mitigation plans. Inside you will find valuable information for your jurisdictions, such as:

- **Historic Flood Events Organized by River Basin.** It is important to maintain a community's memory of past events so that flood threats are not forgotten, and actions are taken to protect lives and reduce repeated damage. This section canvasses the state and narrates floods from decades previous.
- **Risk Statistics.** The plan contains a wealth of data detailing the following and more: flood insurance claim counts and quantities; numbers of repetitive loss properties; values and



quantities of assets at risk of flooding, including: crops, buildings, infrastructure, and populations; and, annualized flood frequencies per county.

- **Mitigation Ideas and Resources.** Looking for ideas as to how to mitigate flood losses? The plan includes 50 new mitigation measures that your jurisdiction can consider implementing. In the appendix you'll find project sheets describing in detail a selection of key mitigation action topics such as stormwater best management practices, low impact development, flood hazard education, and floodplain acquisition.
- **Funding and Service Providers.** Various financial resources from multiple entities are described in detail. Profiles of the many services available from state and federal agencies are also provided. ■

- Natural Resources Conservation Service
- Nebraska Department of Natural Resources
- Nebraska Emergency Management Agency
- Nebraska Department of Economic Development.

If you have additional projects to include in the map or have questions on this project, please contact Jamie Reinke at Jamie.Reinke@nebraska.gov. ■

BFEs cont. from page 2.

Acceptable Uses of a BFE

BFEs determined by NeDNR are valid to assist floodplain administrators in determining the elevation requirements for small scale developments. Projects such as single-family homes, small to medium sized non-residential structures, and most developments that will not substantially change the grade within the floodplain can rely on the elevations calculated by NeDNR. They can also be used for:

- Letters of Map Amendment (LOMAs) on existing structures, and
- Elevation Certificates on existing structures.

It is still recommended that all new development obtain site specific data from a professional engineer. In addition, floodplain administrators must keep in mind that no development or substantial improvement maybe permitted within the floodplain unless the applicant has demonstrated that the proposed development will not cause an unacceptable rise in the water surface elevation of the base flood at any location. State determined

BFEs should be used by the engineer as a tool for this determination, but it cannot act as an unacceptable rise determination. For questions on unacceptable rise, contact the NeDNR floodplain management section.

Inappropriate Uses of a BFE

Because BFEs are developed using basic engineering methods and bare earth topographic data, there are limitations to what they can be used for. BFEs determined by the NeDNR cannot be used for:

- Design of developments greater than 5 acres or 50 lots (44 CFR 60.3), and
- Hydraulic structure design.

These large-scale developments may substantially change the existing grade or flow patterns within the floodplain, causing the BFE determinations to be invalid. To bring it into perspective, imagine a builder comes to your office wanting to place 2 feet of fill dirt across 15 acres of land in the floodplain. As a floodplain administrator and as a permitting official, you would not want to continue using the BFE determined using the pre-development conditions

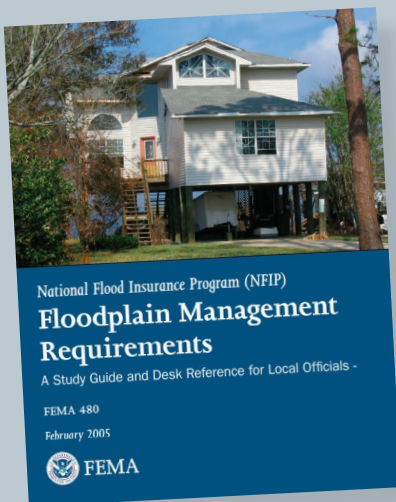
to permit this fill. Instead, developers who intend to build large subdivisions, fill large areas, or construct hydraulic structures will be required to have a registered professional engineer complete a hydraulic study of the area to determine site specific flood elevations.

If you have any other questions about BFEs or their uses, please contact the NeDNR engineers using dnr.bfe@nebraska.gov or go to dnr.nebraska.gov/floodplain/request-base-flood-elevation to learn more. ■

YOUR SUGGESTIONS WELCOME!

What common permitting situations you have experienced in your community and would like to see discussed in the NeDNR Floodplain newsletter? Please send suggestions to Adele Phillips at Adele.Phillips@Nebraska.gov

Coming in 2023!



LO273

Managing Floodplain Development Through the National Flood Insurance Program

January 23 - 26, 2023
University of Nebraska-Omaha

NeDNR, Iowa DNR, FEMA Region VII, and NeFSMA are excited to offer this FREE 4-day floodplain management course. It is perfect for individuals interested in becoming Certified Floodplain Managers (CFM). The course is tailored to Floodplain Managers, Community Planners, and Elected Officials, and specifically for those officials with less than 3 years of floodplain management experience. The course will focus on the NFIP and concepts of floodplain management, maps and studies, ordinance administration, and the relationship between floodplain management and flood insurance. **Mark your calendar and watch for more information to be coming soon:**

<https://dnr.nebraska.gov/floodplain/training-and-workshops>

Mark Your Calendar

10.25 ■

Floodplain Management Workshop

8:30 AM - 5:00 PM

Syracuse, NE

The Nebraska Department of Natural Resources will offer an in-person workshop covering the fundamentals of floodplain management. The topics include: Floodplain Development permits, the permitting process, map reading, LOMAs, LOMR-Fs, and Substantial Damage and Improvement. To learn more and to register, visit this [link](#).

10.26 ■

Rapid Needs Assessment

8:00 AM - 4:30 PM

Mason City, IA

Hosted by Iowa Homeland Security and Emergency Management, this course teaches local government officials how to perform a Rapid Needs Assessment accurately within the first few hours after an incident or emergency is critical in providing a response designed to save lives. For more information and to register, visit this [link](#).

10.26 - 10.27 ■

NEMA Training Evacuation and Re-Entry Planning

8:00 AM - 5:00 PM

Kearney, Nebraska

Hosted by NEMA, participants will further grow their knowledge and skills needed to design and carry out an evacuation and re-entry plan for their jurisdictions. For more information and to register, visit this [link](#).

10.27 □

Floodplain Questions and Answers

11:30 AM - 12:30 PM

Join the staff at Missouri State Emergency Management Agency for a 1-hour "lunch and learn." This session is an open-ended opportunity to submit your questions and have them answered. To learn more and to register, visit this [link](#).

11.15 □

CRS Webinar Series: Stormwater Management Regulations

12:00 PM - 1:00 PM

The CRS Webinar Series provides both live and on-demand training to communities that are not yet participating in the Community Rating System, local government staff who are new to the CRS, and those with experience in the program. The Series includes basic introductory sessions and more advanced topics, most averaging about an hour in length. For more information and to register, visit this [link](#).

11.15 ■

2022 Substantial Damage Estimator (SDE) 3.0

9:00 AM - 5:00 PM

Marble Hill, MO

When structures located within the Special Flood Hazard Area (SFHA) are damaged, the Floodplain Administrator must complete a Substantial Damage Estimation (SDE). SEMA Floodplain staff has developed a workshop teaching all aspects of FEMA's SDE 3.0 program. Communities attending the workshop will receive tools to set up the SDE process. Workshop includes an inspection of a damaged building. This workshop is approved for 6.5 hours of Certified Floodplain Manager (CFM) Continuing Education Credits (CECs). For more information and to register, visit this [link](#).

11.16 □

CRS Webinar Series: CRS and Floodplain Species Assessment

12:00 PM - 1:00 PM

The CRS Webinar Series provides both live and on-demand training to communities that are not yet participating in the Community Rating System, local government staff who are new to the CRS, and those with experience in the program. The Series includes basic introductory sessions and more advanced topics, most averaging about an hour in length. For more information and to register, visit this [link](#).

Mark Your Calendar *Continued*

11.17 □
Introducing the Community Assistance Contact and the Community Assistance Visit

2:00 PM - 3:00 PM

You never know how well something is working until you inspect it. NFIP communities will soon receive a “Community Assistance Contact” or “Community Assistance Visit” to help them identify, prevent and resolve floodplain management issues BEFORE they develop into larger problems. For more information and to register, visit this [link](#).

11.22 ■
NeFSMA 2022 Annual Membership Meeting

Time TBD
 Nebraska Innovation Campus
 Lincoln, NE

An agenda and registration details will be available soon. To learn more, visit this [link](#).

11.30 □
Virtual Office Hours: Floodplain Q & A

9:00 AM - 10:00 AM

Has placing a call to NeDNR regarding a question or issue been on your to-do list? Mark your calendar now to join floodplain staff to obtain answers to your floodplain related questions. This time is for an open discussion, to ask questions and receive resources regarding floodplain topics of your choice! We will welcome all questions from the very basic to the most advanced! Or, feel free to join us to just listen in on topics of interest from other communities! To learn more, visit this [link](#).

12.06 - 12.07 ■
Disaster Management for Public Services

8:00 AM – 5:00 PM
 West Plains, MO

This course prepares public service professionals to extend their knowledge and skills to protect their communities and infrastructures from future and active threats. During this course, students will work together in multidisciplinary teams. Together, they will apply the course content in many hands-on, small group activities and disaster scenarios. For more information and to register, visit this [link](#).

12.13 - 12.15 ■
Mitigation for Emergency Managers

8:00 AM - 5:00 PM
 Jefferson City, MO

This course is built to enhance non-technical emergency worker’s mitigation skills. Participants will find strategies to build support for mitigation planning in communities. They will also analyze hazard risks for given scenarios. For more information and to register, visit this [link](#).

12.15 □
Basic Floodplain Administration

10:00 AM - 3:00 PM

This 4 hour virtual class on the fundamentals of floodplain management is suitable for both novice and seasoned floodplain administrators. The class will cover permits and the permitting process, map reading, LOMAs and LOMR-Fs, and substantial damage assessments. For more information and to register, visit this [link](#).

October

Su	M	Tu	W	Th	F	Sa
		25	26	27		

November

Su	M	Tu	W	Th	F	Sa
		15	16	17		
		22				
			30			

December

Su	M	Tu	W	Th	F	Sa
		06	07			
		13	14	15		

Want More Information?

Visit the NeDNR Floodplain Management website at: <https://dnr.nebraska.gov/floodplain>

Check out our Interactive Floodplain map at: <http://ne.gov/go/floodriskmap>

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Or, stop by! **NeDNR is pleased to announce that our office has relocated.**
Please note the address change below and stop in to see our exciting new space.

This newsletter is produced by the NeDNR Floodplain Management Section and is partially supported by funding through a Cooperative Agreement with the Federal Emergency Management Agency. The contents do not necessarily reflect the view and policies of the federal government.