

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Floodplain Management Basics

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Floodplain Zoning, 1 of 3 Part Webinar Series



ZOOM MEETING HOUSEKEEPING

- You will be muted and video turned off upon entry.
- We ask that you keep video off to decrease the chances of bandwidth problems.
- If you wish to ask a question, type it in the chat or raise “your hand.”
- If you are interested in receiving CFM continuing education credits, please provide us your name and contact information.
- This session will be recorded and made available to view later.



What is your role? (select all that apply)

- Elected Official
- Planning/Zoning
- Engineering/Public Works
- Floodplain Manager
- Other – type in chat box

How many people are watching from your site?

- 1, 2, 3, 4, 5, 6+

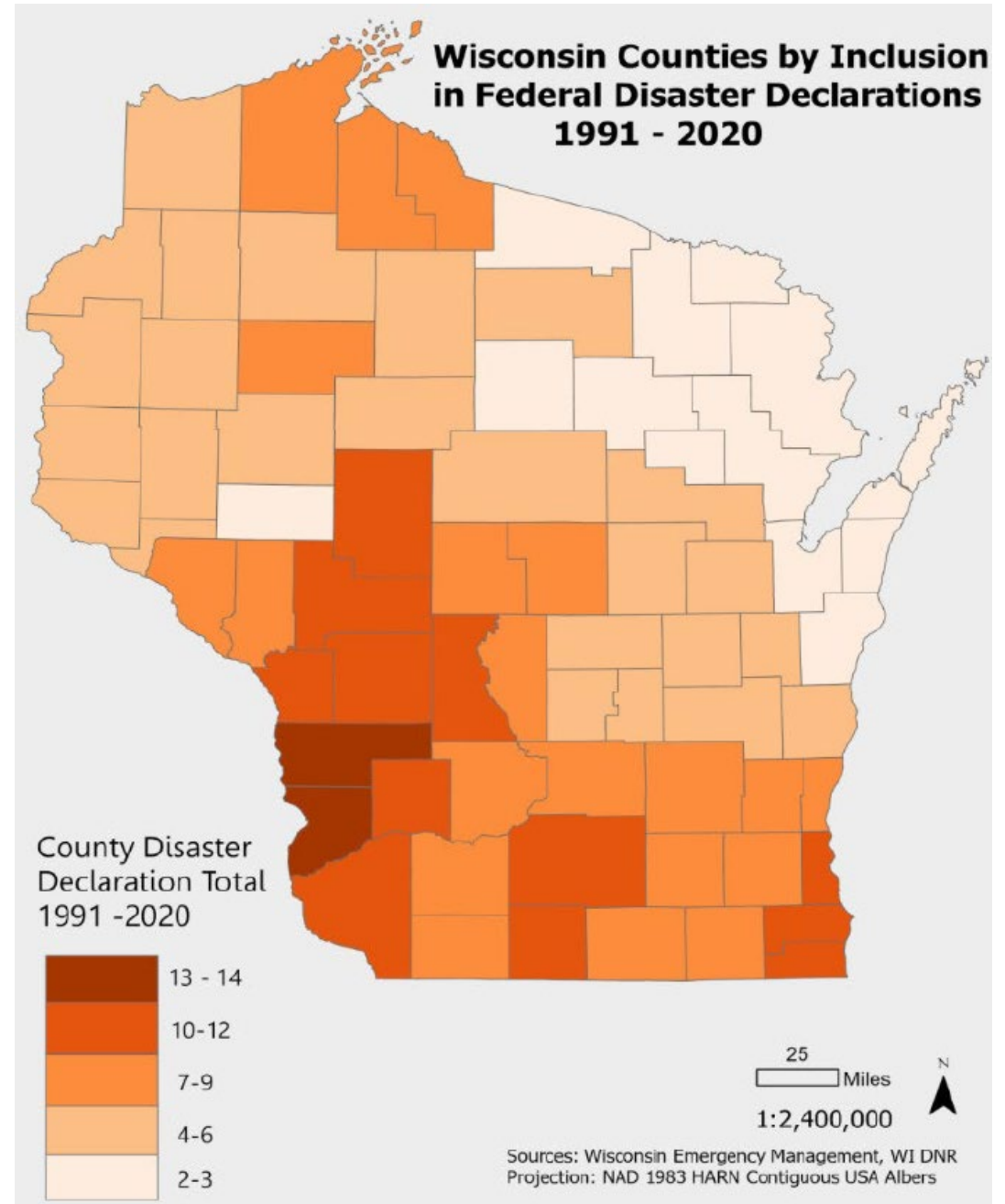
Webinar 1 – March 21, 2024

Floodplain Management Basics

- Goals of the floodplain program
- Role of FEMA, DNR, and municipalities
- Basics of floodplain zoning
- Additional tools



Federal Disaster Declarations

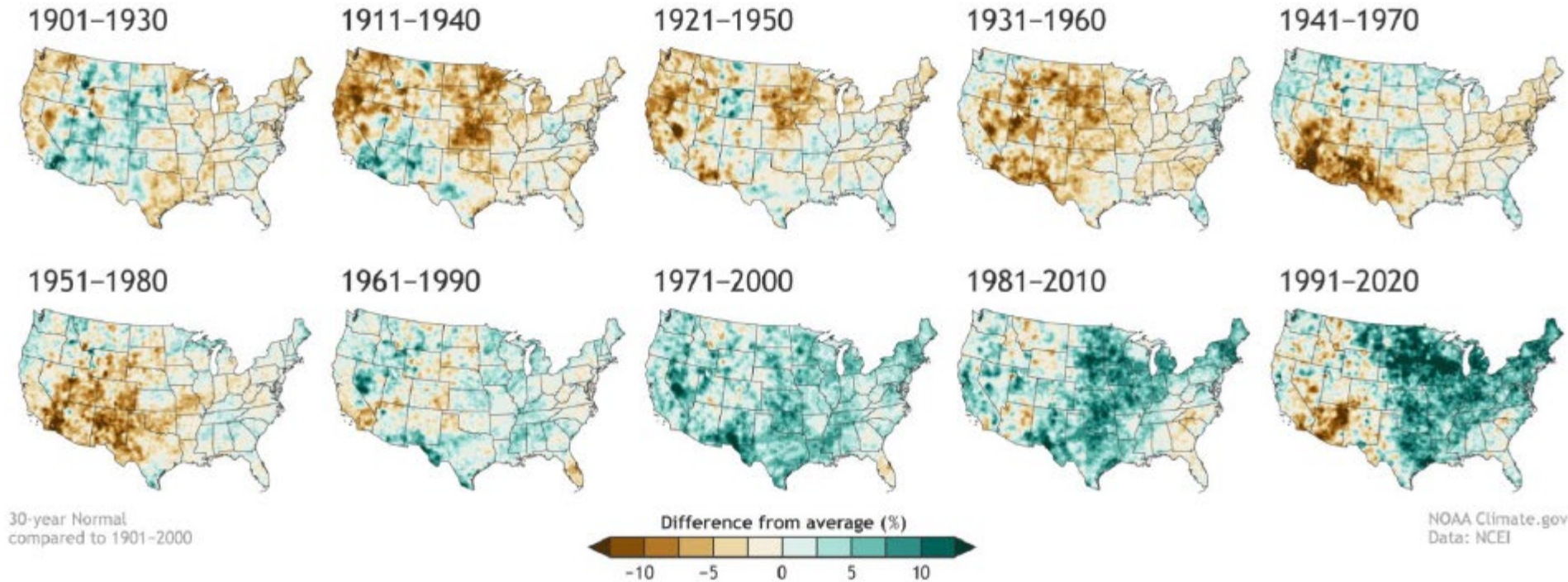


Wetter: Changes in Climate Normals

Climate “normal”: an adjusted 30-year average, based on data ending in a “zero” year (e.g., 2020)

<https://www.climate.gov/news-features/understanding-climate/climate-change-and-1991-2020-us-climate-normals>

U.S. ANNUAL PRECIPITATION COMPARED TO 20th-CENTURY AVERAGE



Monroe County – Climate Change Task Force

Flood damage per decade in Monroe County (EM)

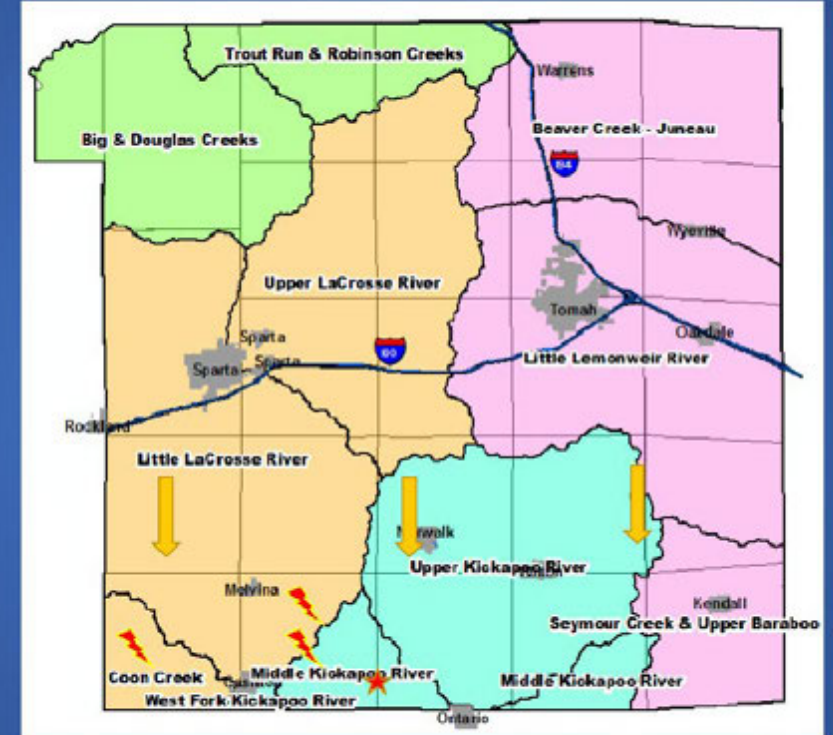


Localized Rain Events

Ave. Annual Rainfall = 33"
April 3rd – Dec. 31, 2018
★ 60.79"



⚡ 2019
July 3rd (4-5"/1.5 hrs)
July 9th (1"/20 min)
July 18th (6-8"/2 hrs)



Monroe County - Watersheds

WHAT IS FLOODPLAIN MANAGEMENT?

Floodplain management is a partnership between:

- Federal Regulations (44 CFR 59-72)
- State Regulations (NR 116)
- Local Ordinance

Management of development in the floodplains results in construction practices that can reduce flood losses and the high costs associated with flood disasters to all levels of government.

Purpose and Intent

- To protect human life and health;
- To minimize expenditure of public money and costly flood control projects;
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- To minimize prolonged business interruptions;
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard.

NATIONAL FLOOD INSURANCE PROGRAM

- Created by the National Flood Insurance Act of 1968
- Participation is **voluntary**
- **Community Role**
 - Adopt and enforce regulations
- **FEMA Role**
 - Provide flood insurance



COMPONENTS OF THE NFIP



Federal Role

44 CFR 60.1(d)

“The criteria set forth in this subpart are minimum standards for the adoption of flood plain management regulations by flood-prone, mudslide (i.e., mudflow)-prone and flood-related erosion-prone communities. Any community may exceed the minimum criteria under this part by adopting more comprehensive flood plain management regulations utilizing the standards such as contained in subpart C of this part. In some instances, community officials may have access to information or knowledge of conditions that require, particularly for human safety, higher standards than the minimum criteria set forth in subpart A of this part. Therefore, any floodplain management regulations adopted by a State or a community which are more restrictive than the criteria set forth in this part are encouraged and shall take precedence.”



State Role (Wisconsin DNR)

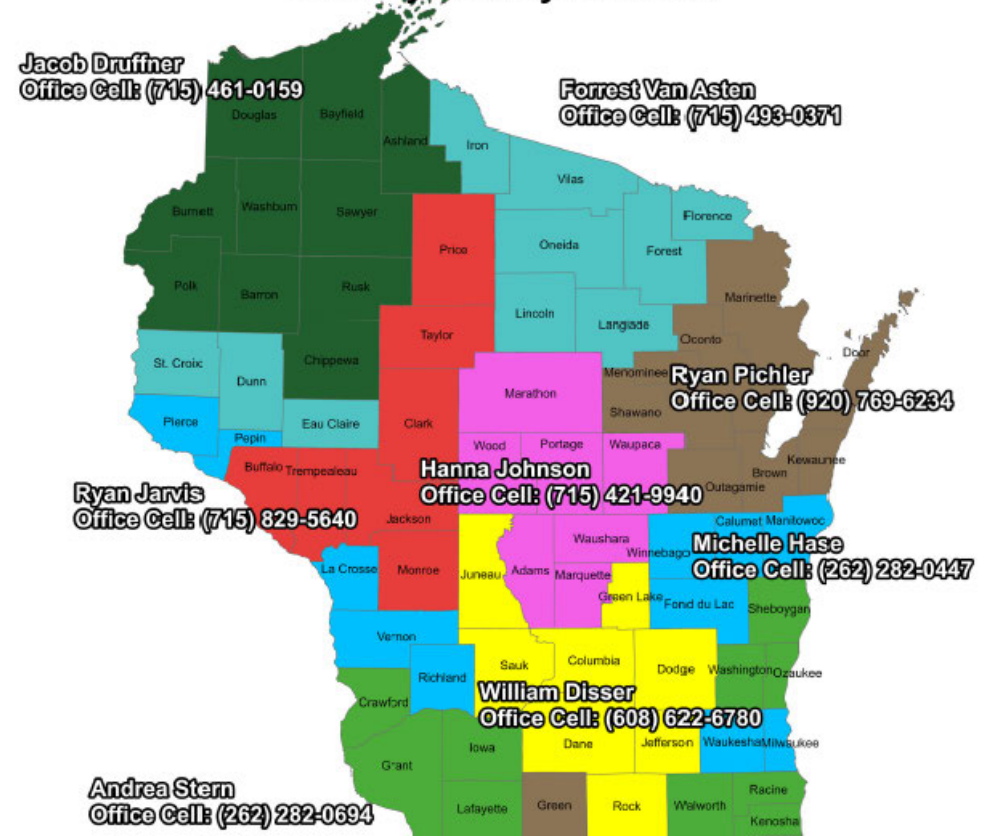
- Provide technical assistance and training for NFIP compliance
- Conduct Community Assistance contacts and visits
- Facilitate Flood Insurance Rate Map remapping process
- Review and approve community ordinances
- Attend community meetings as requested
- Provide model ordinance for communities
- Inform and educate the public



W DNR Dam Safety & Floodplain

DNR Floodplain Contacts by County: Water
Management Engineer Contact Information | |
Wisconsin DNR

WME-by-county-External



CENTRAL OFFICE

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Local Role

- Adopt & enforce floodplain ordinance
- Minimize flood damage
- Issue permits for development in Special Flood Hazard Areas (SFHAs)
- Require elevation data for SFHA structures
- Provide flood zone determinations
- Substantial damage/substantial improvement determinations during disaster & non-disaster events
 - Field Inspections
 - Rectify Violations
 - Inform & educate public
 - Set up filing system for audits

State Model Ordinance

New State Model Ordinance (October 5, 2021) includes:

- Act 175 was enacted March 2020 and created §87.30 (1d)(d), Wis. Stats
- Coastal language
- Clarifying language in floodfringe, campground, removal of lands from the floodplain, cumulative 50% rule
- <https://dnr.wisconsin.gov/topic/FloodPlains/modelZoningOrdinances.html>

Resolution to Participate in the NFIP

RESOLUTION TO APPLY TO PARTICIPATE IN THE NATIONAL FLOOD INSURANCE PROGRAM

WHEREAS, certain areas of ___(Community)___ are subject to periodic flooding or flood-related erosion, causing serious damages to properties within these areas; and

WHEREAS, relief is available in the form of federally subsidized flood insurance as authorized by the National Flood Insurance Act of 1968; and

WHEREAS, it is the intent of the ___(board, legislature, council, etc.)___ to require the recognition and evaluation of flood or flood-related erosion hazards in all official actions relating to land use in areas having these hazards; and

WHEREAS, this body has the legal authority to adopt land use and control measures to reduce future flood losses pursuant to ___(cite appropriate section of relevant authority)___,

NOW, THEREFORE, BE IT RESOLVED, that this ___(board, legislature, council, etc.)___ hereby:

1. Assures the Federal Emergency Management Agency that it will enact as necessary in those areas having flood or flood-related erosion hazards, adequate land use and control measures with effective enforcement provisions, including:
 - a. Require permits for all proposed construction or other development in the community so that it may determine whether such construction or other development is proposed with the floodplain.
 - b. Review proposed development to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law.
 - c. Review and maintain all permit applications to determine whether proposed building sites will be reasonably safe from flooding.
 - d. Review and maintain all permit applications to ensure that any development activities are consistent with criteria set forth in Section 60.3 of the National Flood Insurance Program Regulations.

Definition of Development

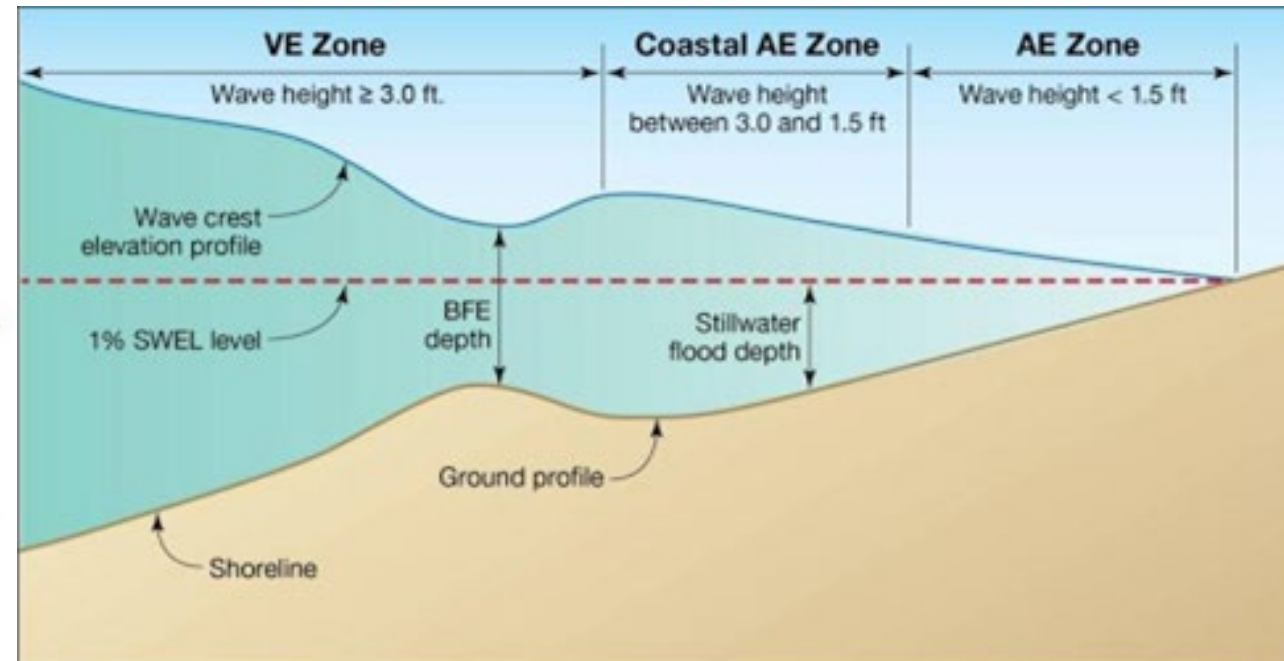
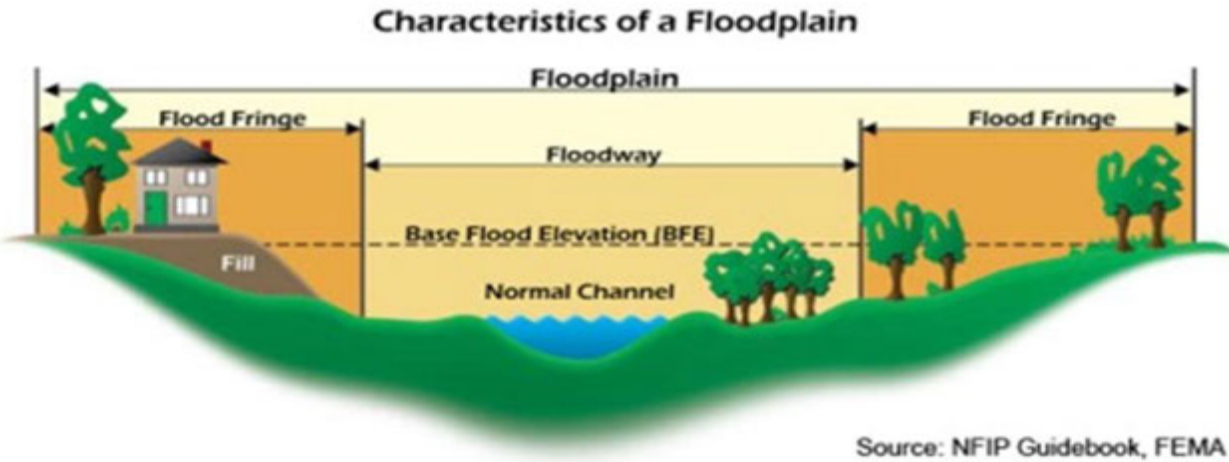
- “...means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.”



Definitions & Synonymous Terms

- Floodway
 - The channel portion of a river or stream, and those portions of the floodplain adjoining the channel required to carry the regional flood discharge.
- Floodfringe
 - That portion of the floodplain outside of the floodway, which is covered by flood water during the regional flood. The term is generally associated with standing water rather than flowing water.
- Zone AE
 - The base floodplain where regional flood elevations (RFEs) are provided.
- Zone A
 - The base floodplains mapped by approximate methods, i.e., RFEs are not determined. Often called unnumbered A Zone or approximate A zone. Without a study, Zone A needs to be treated as floodway.
- 1% Chance Flood
- 100-Year Flood
- Base Flood Elevation or BFE (FEMA)
- Regional Flood Elevation or RFE (Wisconsin DNR)
- Special Flood Hazard Area or SFHA
- High Flood Risk Area
- These areas have a 26% chance of flooding over the life of a 30-year mortgage.

What is a floodplain?



UNDERSTANDING THE FIRM REGULATORY REQUIREMENTS

•Floodway

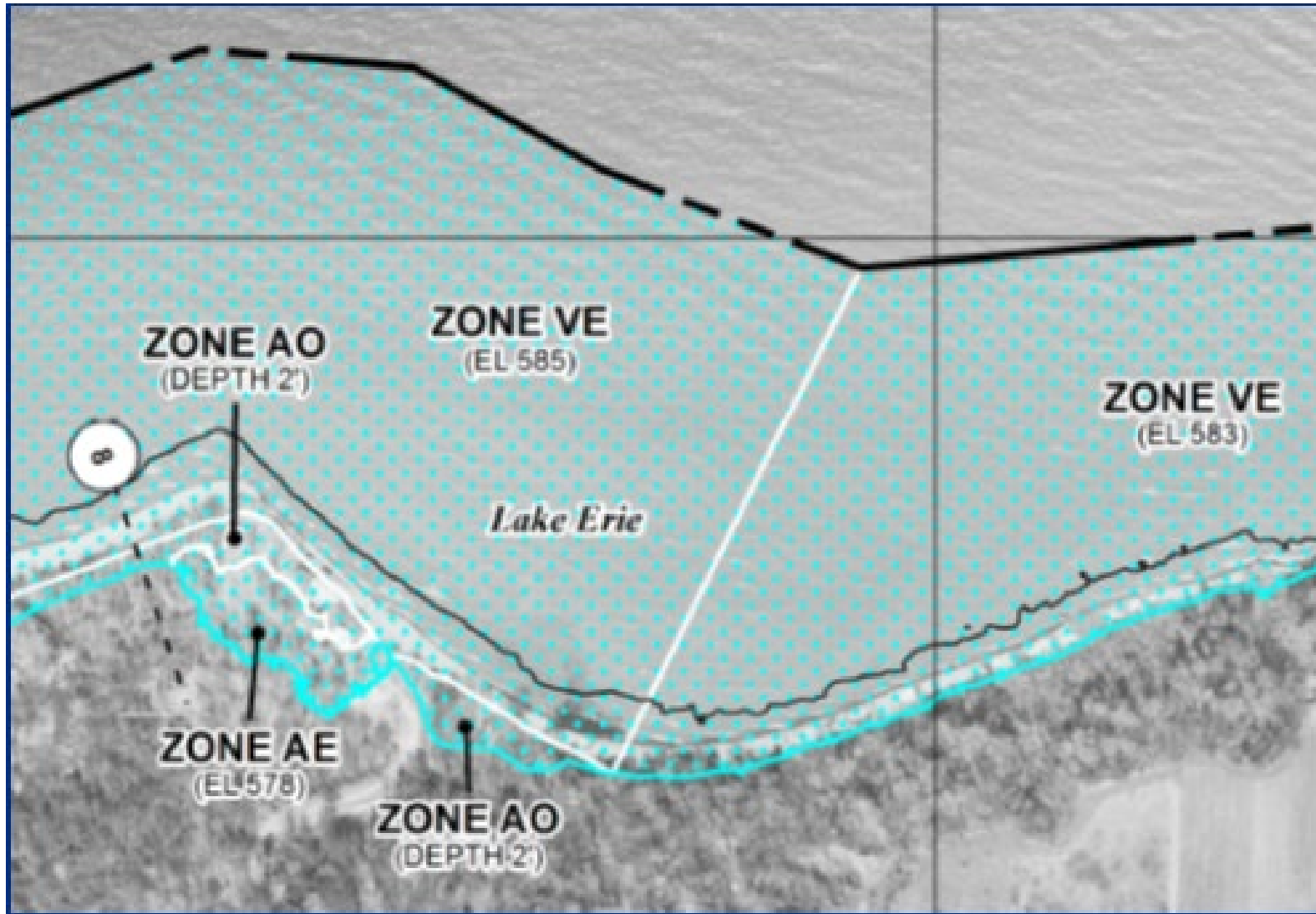
•Zone AE

•Zone A

•Zone X

•Shaded
•Zone X





Where can I find flood maps?

The image displays two web pages. The top page is the FEMA Flood Map Service Center (FEMA FLOOD MAP SERVICE CENTER) website, featuring a navigation menu on the left and a main content area with a search bar and introductory text. The bottom page is the WDNR Surface Water Data Viewer website, showing a navigation menu and a main content area with a search bar and introductory text. A large satellite map of Jefferson County, Wisconsin, is overlaid on the right side of the FEMA page, showing flood hazard areas in red and blue.

FEMA FLOOD MAP SERVICE CENTER

Resources

FEMA Flood Map Service Center: Welcome!

Looking for a Flood Map? [View](#)

Enter an address, a place, or longitude/latitude coordinates

Looking for more than just a current flood map? Visit [Search All Products](#) to access the full range of flood risk products for your community.

Local GIS Interactive Mapping

Jefferson County Wisconsin

WDNR Surface Water Data Viewer

Surface Water Data Viewer

The Surface Water Data Viewer (SWDV) is a Wisconsin DNR data delivery system that provides interactive webmapping tools for a wide variety of datasets including chemistry (water, sediment), physical, and biological (macroinvertebrate, aquatic invasive) data.

The new interactive web mapping application for surface water resources has nearly all the capabilities as the old version as well as a number of new features. One major difference between the old and new versions is that the new interface has tabs which group similar sets of tools (similar to MS Word or Excel). Typing in layers, panning and zooming are more seamless, with much shorter page loading times. Other new features include more drawing tools, the ability to add a CSV or shapefile, and the ability to change coordinate systems.

- Surface water
 - SWIMS help guide
 - SWIMS data model
 - Surface water viewer
 - Street labels data
 - River & stream data
 - Hydrography data

Flood Insurance Study (FIS)

In addition to the Flood maps, use the flood insurance study to look at:

1. Floodway Data table (shows quantity of water flow and elevations at the mapped cross sections. This gives nearest .1 ft of 0.01 ft, whereas map may give 1 ft elevation)
2. Base Flood Elevations (BFEs) are provided
3. Profile data – shows water elevation at river, culvert and bridge locations on a graph

FLOOD INSURANCE STUDY



EAU CLAIRE COUNTY, WISCONSIN, AND INCORPORATED AREAS

Community Name	Community Number
Albion, City of	550120
Augusta, City of	680127
Eau Claire County, Unincorporated Areas	555552
Eau Claire, City of	550128
Falchid, Village of	550129
Fall Creek, Village of	550130



REVISED:
APRIL 16, 2014

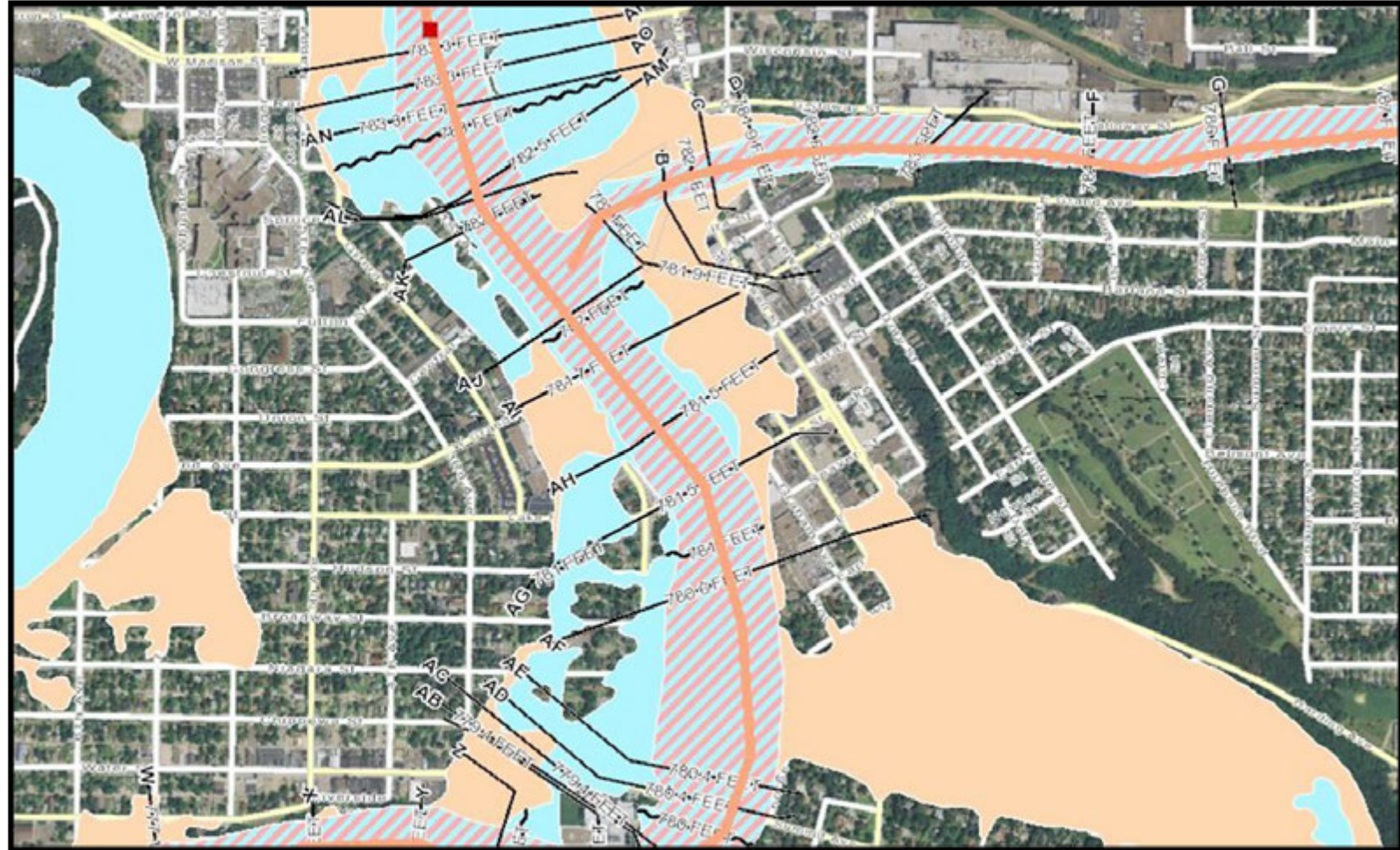


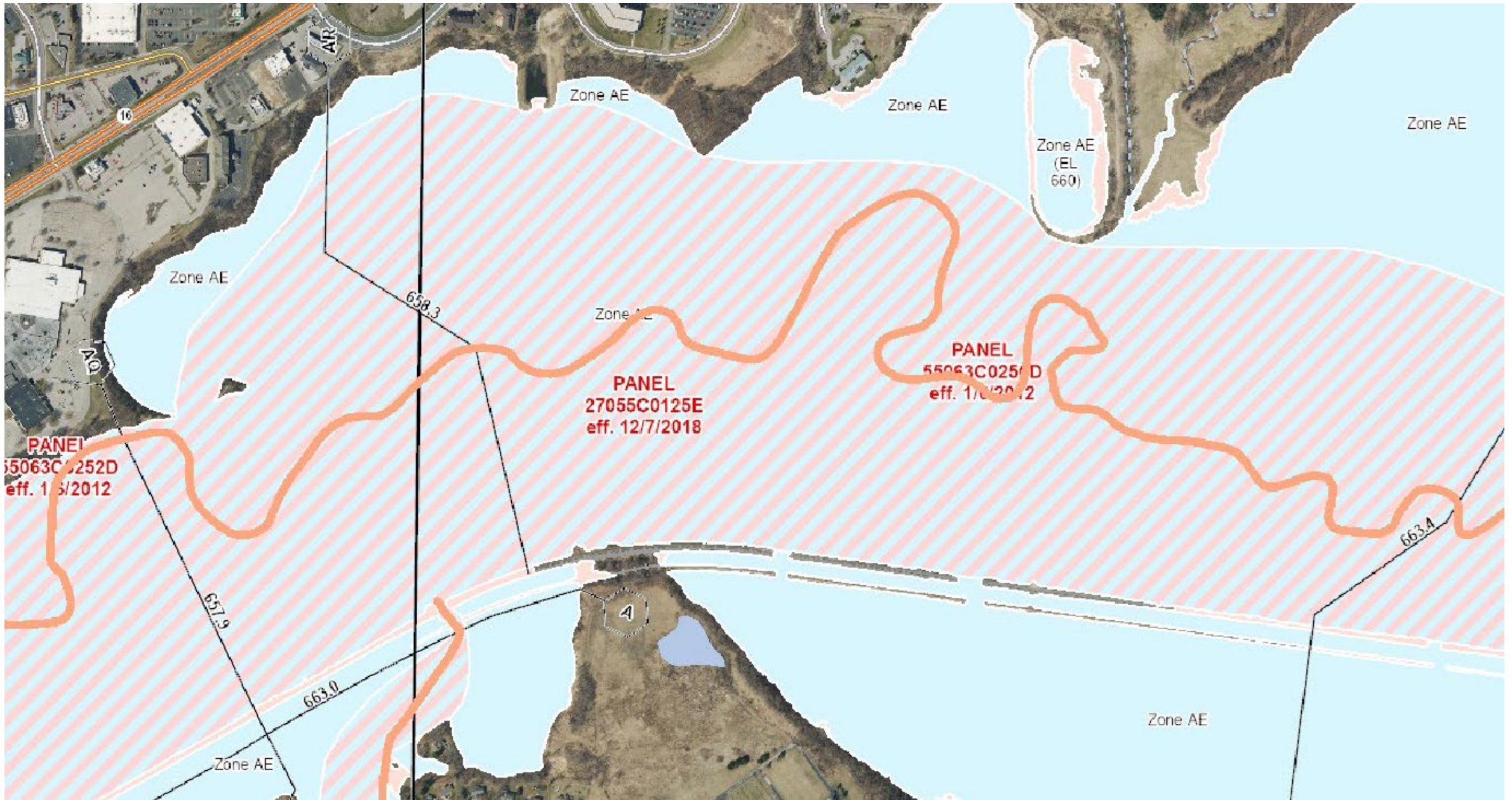
Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
55035CV00B

APPLICATIONS OF FIRM AND FIS

- Identify Special Flood Hazard Areas (SFHA)
- Identify the location of a specific property
- Estimate a Regional Flood Elevation (RFE) at a specific site
- May need to use the regional flood profiles if the property is located between cross sections
- Determine locations of the regulatory floodway

ZONE AE





FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
LA CROSSE RIVER (CONTINUED)									
AK	29,435	146	1,077	4.6	0	653.0	653.0	653.0	0.0
AL	29,524	147	1,027	4.8	0	653.0	653.0	653.0	0.0
AM	30,026	415	2,062	4.4	0	654.1	654.1	654.1	0.0
AN	30,742	490	3,070	3.0	0	655.0	655.0	655.0	0.0
AO	30,987	398	2,545	3.7	218	655.4	655.4	655.4	0.0
AP	32,380	563	3,763	2.5	131	657.0	657.0	657.0	0.0
AQ	37,320	1,681	9,781	1.0	0	657.9	657.9	657.9	0.0
AR	40,029	2,741	14,108	0.7	0	658.3	658.3	658.3	0.0
AS	49,528	2,167	7,751	1.2	0	663.4	663.4	663.4	0.0
AT	56,728	1,171	7,258	1.3	0	666.5	666.5	666.5	0.0
AU	58,235	1,470	8,976	1.1	0	667.3	667.3	667.3	0.0
AV	63,969	829	5,655	1.5	0	672.7	672.7	672.7	0.0
AW	69,892	2,485	8,848	1.0	0	675.5	675.5	675.5	0.0
AX	76,587	149	1,570	5.5	103	680.4	680.4	680.4	0.0
AY	81,228	222	2,058	4.2	0	686.1	686.1	686.1	0.0
AZ	89,394	193	2,182	3.9	0	691.9	691.9	691.9	0.0
BA	92,752	554	4,892	1.8	0	693.5	693.5	693.5	0.0
BB	125,273	2,598	7,679	1.1	58	711.8	711.8	711.8	0.0

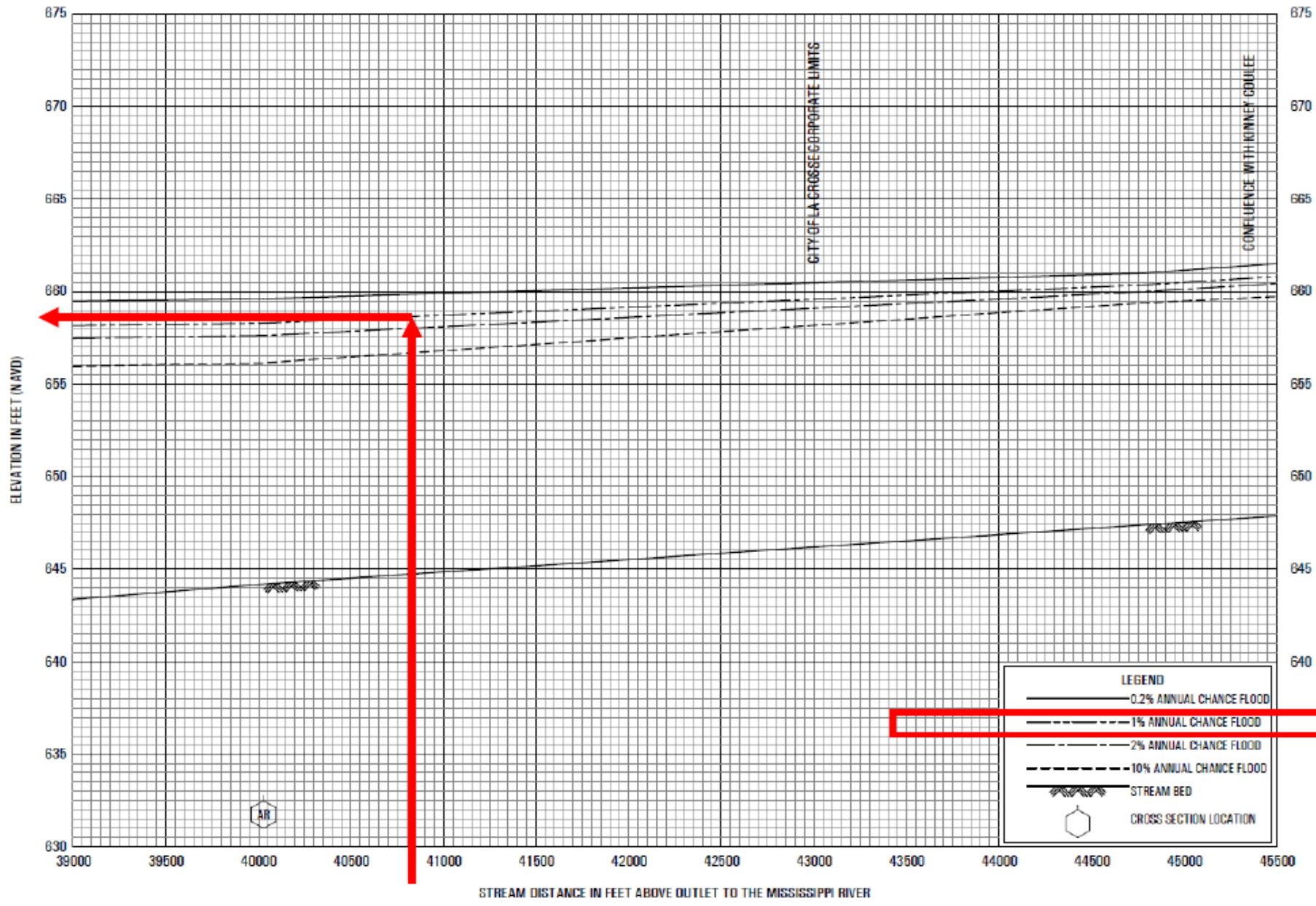
¹Feet above outlet to the Mississippi River

TABLE 13

FEDERAL EMERGENCY MANAGEMENT AGENCY
**LA CROSSE COUNTY, WI
AND INCORPORATED AREAS**

FLOODWAY DATA

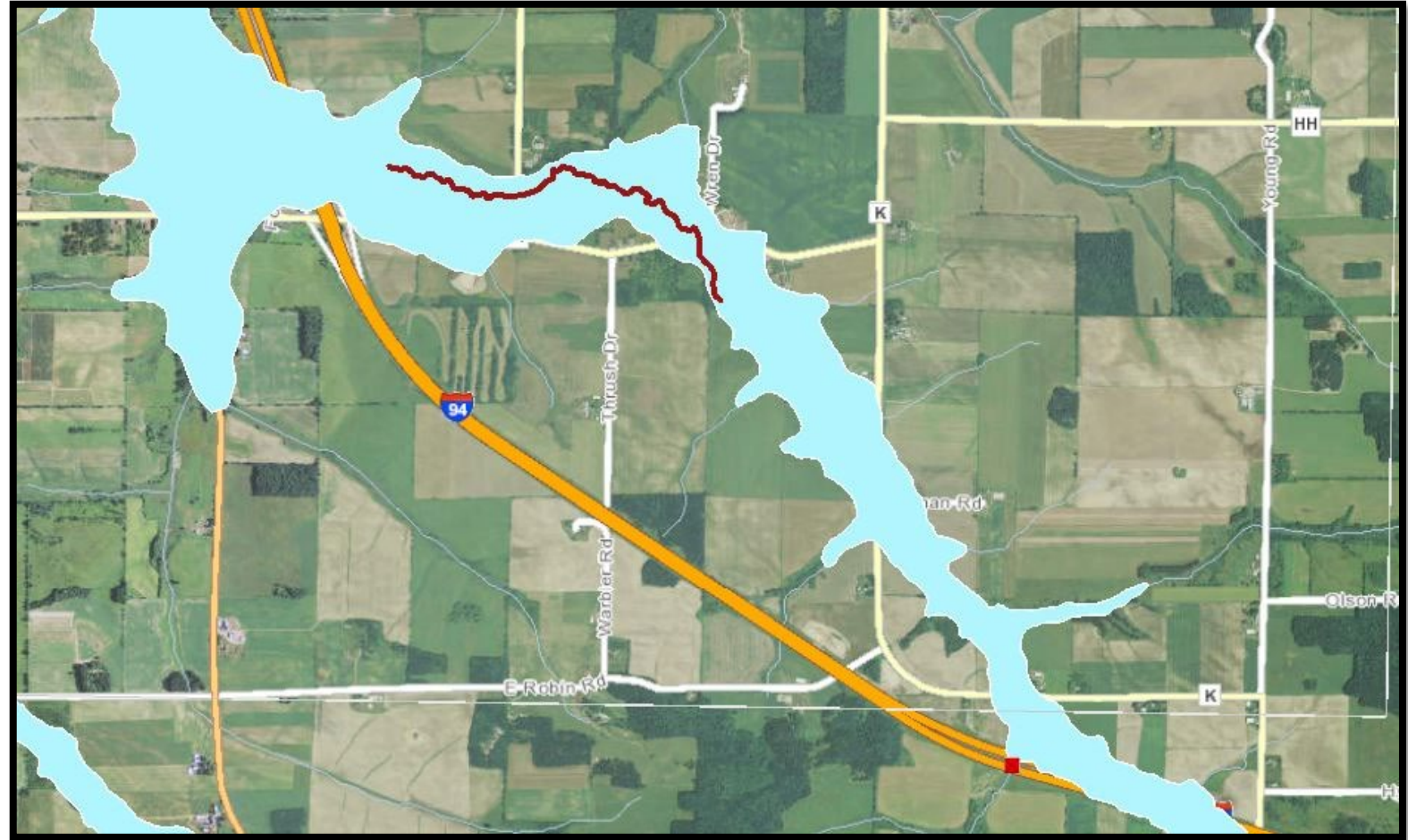
LA CROSSE RIVER



FLOOD PROFILES
LA CROSSE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
LA CROSSE COUNTY, WI
AND INCORPORATED AREAS

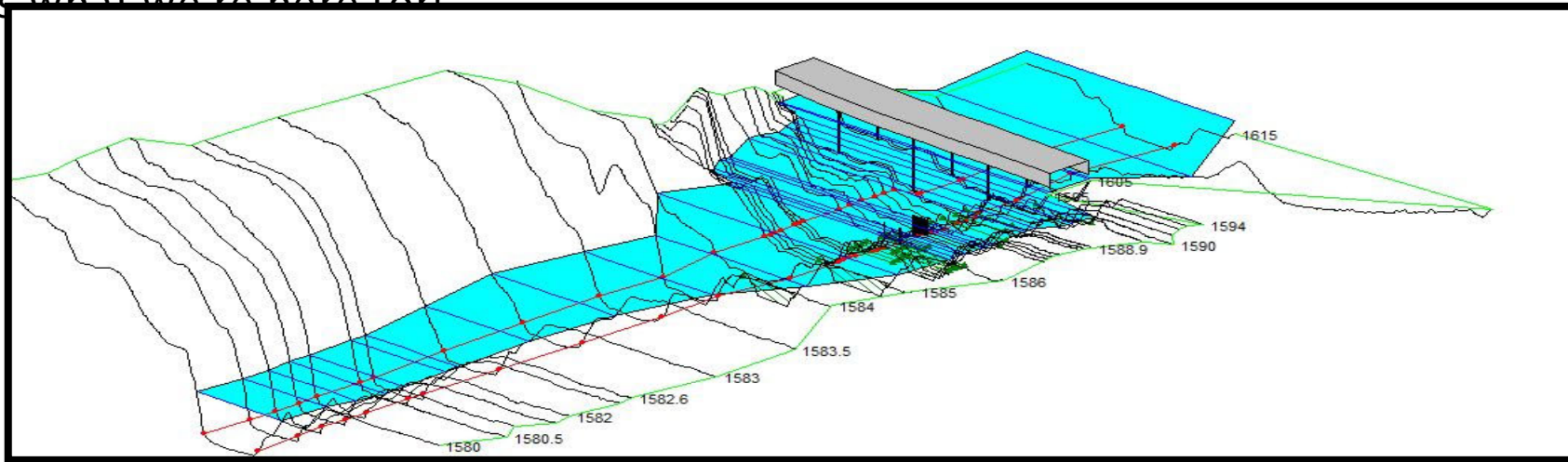
ZONE A



HYDROLOGIC & HYDRAULIC ANALYSES

What exactly is H&H?

- When required, the property owner will need to hire a P.E. to submit an H&H completed using the Army Corps of Engineer Hydrologic Engineering Centers River Analysis System (HEC-RAS)
- Delineates between floodway and flood fringe and determines RFE.
- Investigates if a proposed development causes an impact to the RFE.
- Do not be afraid to consult with your Regional Water Management Engineer (WME), that's what we're here for!



Special Flood Hazard Areas (SFHAs) - Coastal

Zone VE

- Coastal high-hazard zone, where wave action and/or high-velocity water can cause structural damage during the 1-percent-annual-chance flood
- Wave heights or wave runup ≥ 3 feet
- Subdivided into elevation zones, and BFEs are assigned

Zone AE

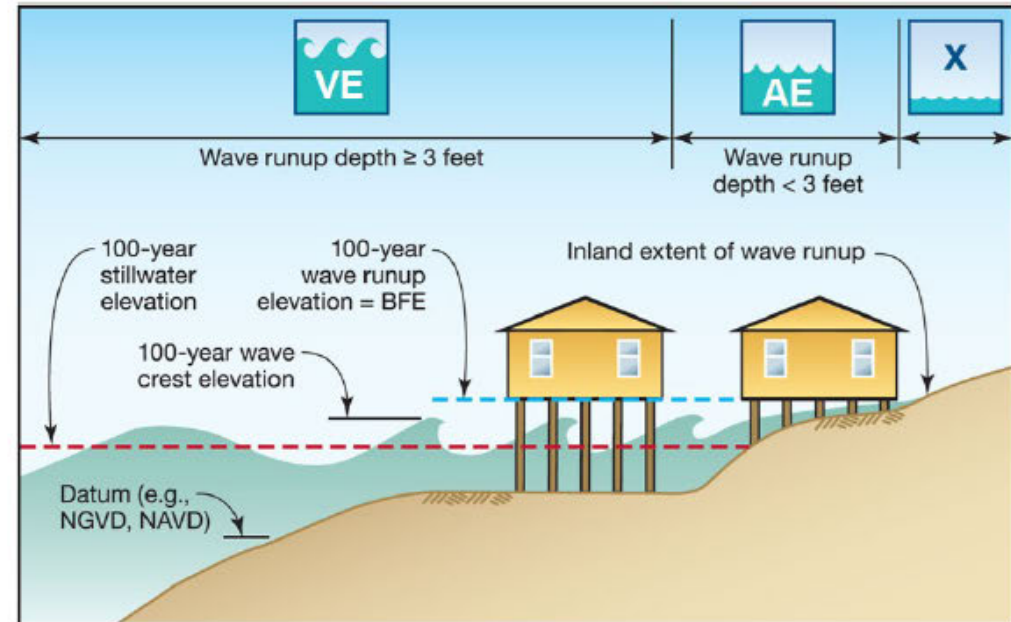
- Applied in areas subject to lower wave energy or inundation by the 1-percent-annual-chance flood
- Wave heights or wave runup < 3 feet
- Subdivided into elevation zones, and BFEs are assigned

Zone AO

- Applied in areas of sheet-flow and shallow flooding
- Given an associated depth instead of a BFE

Zone AH

- Applied in areas of ponding
- Assigned a BFE



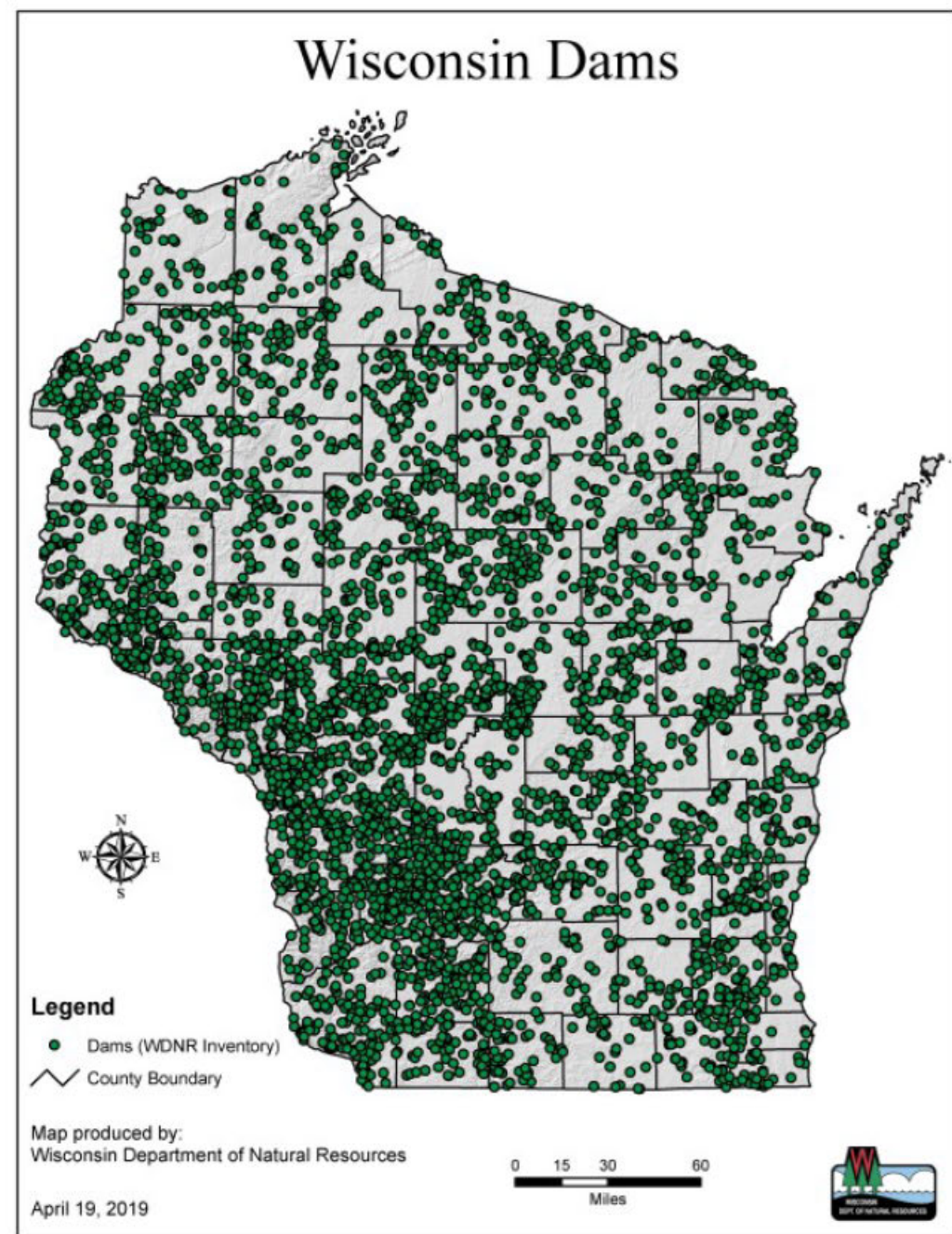
Dam Failure Analyses

- All large dams in the State of Wisconsin require Dam Failure Analyses (DFA)
- NR 116.08(3)(6)(b) – Developed areas downstream of compliant dams shall be zoned and regulated
- Communities should have the DFA flood shadow maps, data tables, and flood profiles listed in their ordinance



Wisconsin Dams

- There are approximately 4000 Dams currently in existence in the State of Wisconsin (1000 large, 3000 small)
- 60% of the dams in Wisconsin are owned by a Company or Private Individual, 9% by the State of Wisconsin, 17% by a Municipality such as Township, or County Government, and 14% by other ownership types

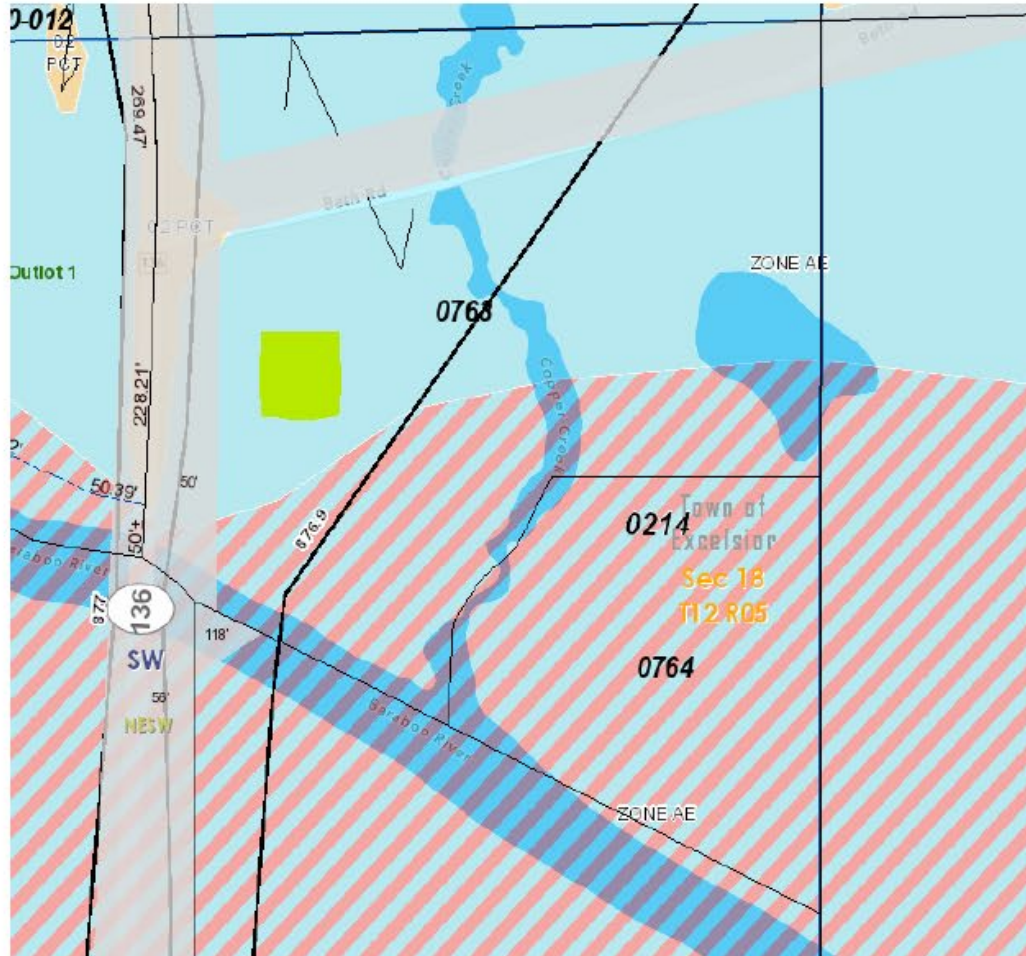


Wisconsin Minimum Standards

Chapter NR 116, Wisconsin Administrative Code Basic Overview

- Exceed NFIP minimum standards (Federal)
- 2ft of freeboard (Flood Protection Elevation = RFE + 2 ft)
- Fill around the residential structure shall be one foot above the regional flood elevation and shall extend at least 15 feet beyond the limits of the building
- Dry land access for new development
- Prohibits most floodway development
- Cumulative improvement standards (50% provision for legal non-conforming structures) (Act 175)
- Zero rise mapping standard (i.e. project cannot cause an increase in the RFE)

Do Minimum Standards Guarantee Flood Protection?





Flooding can happen anywhere, at any time.

Collecting High-Water Marks

<https://pubs.er.usgs.gov/publication/tm3A24>



“High dwellings are the peace and harmony of our descendants. Remember the calamity of the great tsunamis. Do not build any homes below this point.”

Stone markers dotting the Japanese coast warn future decision-makers of poor development decisions.



COMMUNITY RATING SYSTEM (CRS)

The Community Rating System (CRS) recognizes and encourages community floodplain management activities that exceed the minimum NFIP standards. Depending upon the level of participation, flood insurance premium rates for policyholders can be reduced up to 45%.

CRS BASICS

The CRS classes for local communities are based on 18 creditable activities, organized under four categories:

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



CONNECT WITH US

Questions?

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<https://dnr.wisconsin.gov/topic/FloodPlains>



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"WILD WISCONSIN:
OFF THE RECORD"