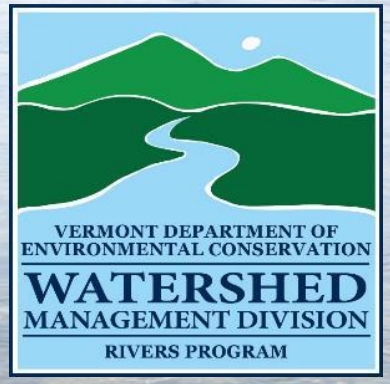
# Testimony on S.213: Floodplain Management, the National Flood Insurance Program, and Climate Resilience




Prepared for the Senate Committee on Natural Resources & Energy

January 11, 2024

**Rebecca Pfeiffer, CFM**
Vermont NFIP Coordinator
River Corridor & Floodplain Protection Program
VT Agency of Natural Resources (VTANR)

# BASIC CONCEPTS

Taken from the Vermont Flood Training site:
https://floodtraining.vermont.gov/

# COMMON TERMS

**Floodplain** – general term to refer to the riparian and upland areas that may be covered by water during a time of flooding.

**Riparian** – a transitional zone of land adjacent to the stream channel. May include wetland areas, river meander scars and vegetation adapted to occasional inundation.

**Special Flood Hazard Area (SFHA)** – specific regulatory term from the National Flood Insurance Program (NFIP). It is the land inundated by the 1% annual chance flood event, commonly also referred to the 100-year flood. This indicates floodplain lands that have been modeled and mapped by FEMA and are subject to regulation under the NFIP.

**Floodway** - specific regulatory term from the NFIP. Refers to a portion of the SFHA that is required to remain unencroached to ensure that the height of the 1% annual chance flood does not increase by more than **1'** within a community due to other new floodplain fill and encroachment.

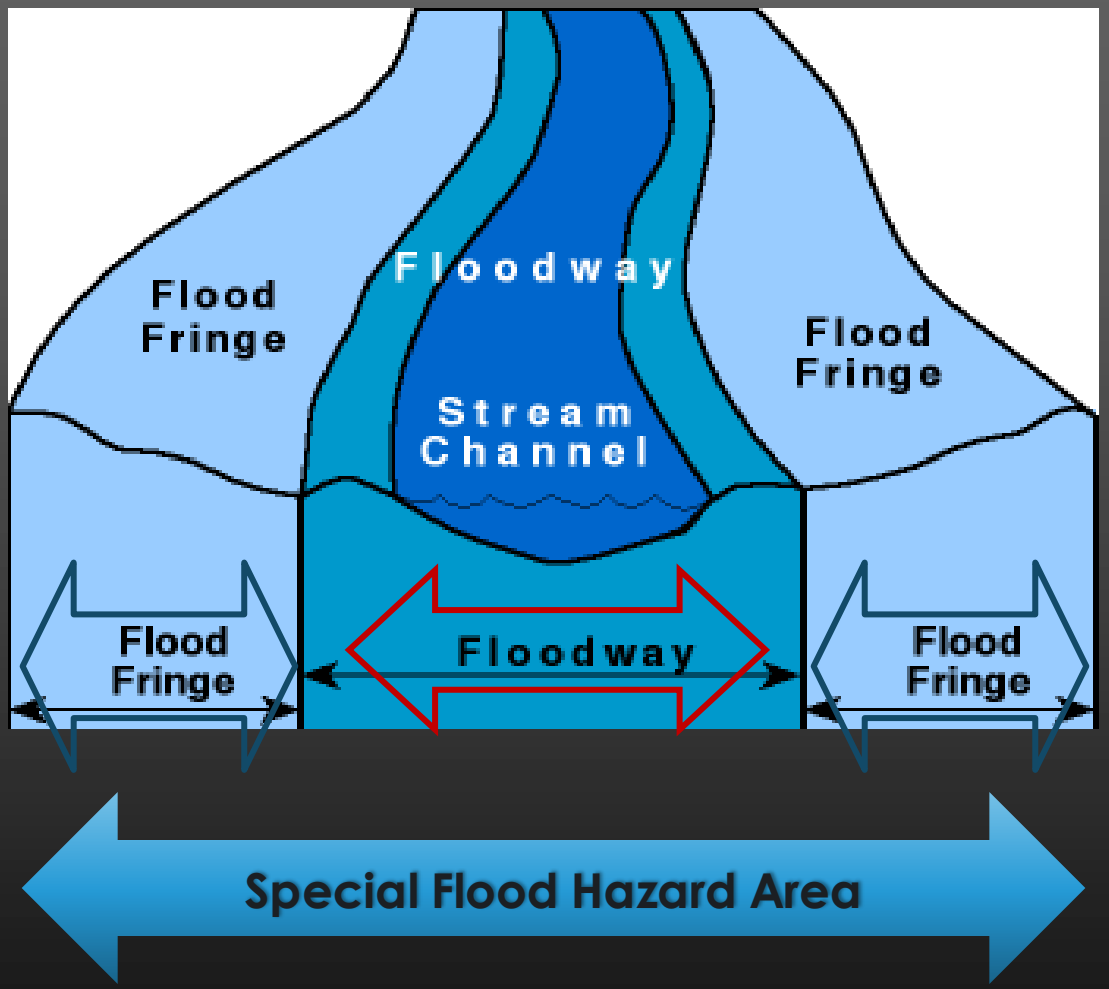
**Base Flood Elevation (BFE)** – specific regulatory term from the NFIP. BFE refers to the height of flood water during a 1% annual chance flood event (aka the 100-year flood).

**Flood Fringe** – specific regulatory term from the NFIP. The portion of the SFHA that is located outside of the floodway. Under minimum NFIP requirements, this area of land can be filled and new construction, housing, encroachments, etc. can be built here.

# FEMA'S SPECIAL FLOOD HAZARD AREA (SFHA)

**Floodway = Flood Right-of-Way**

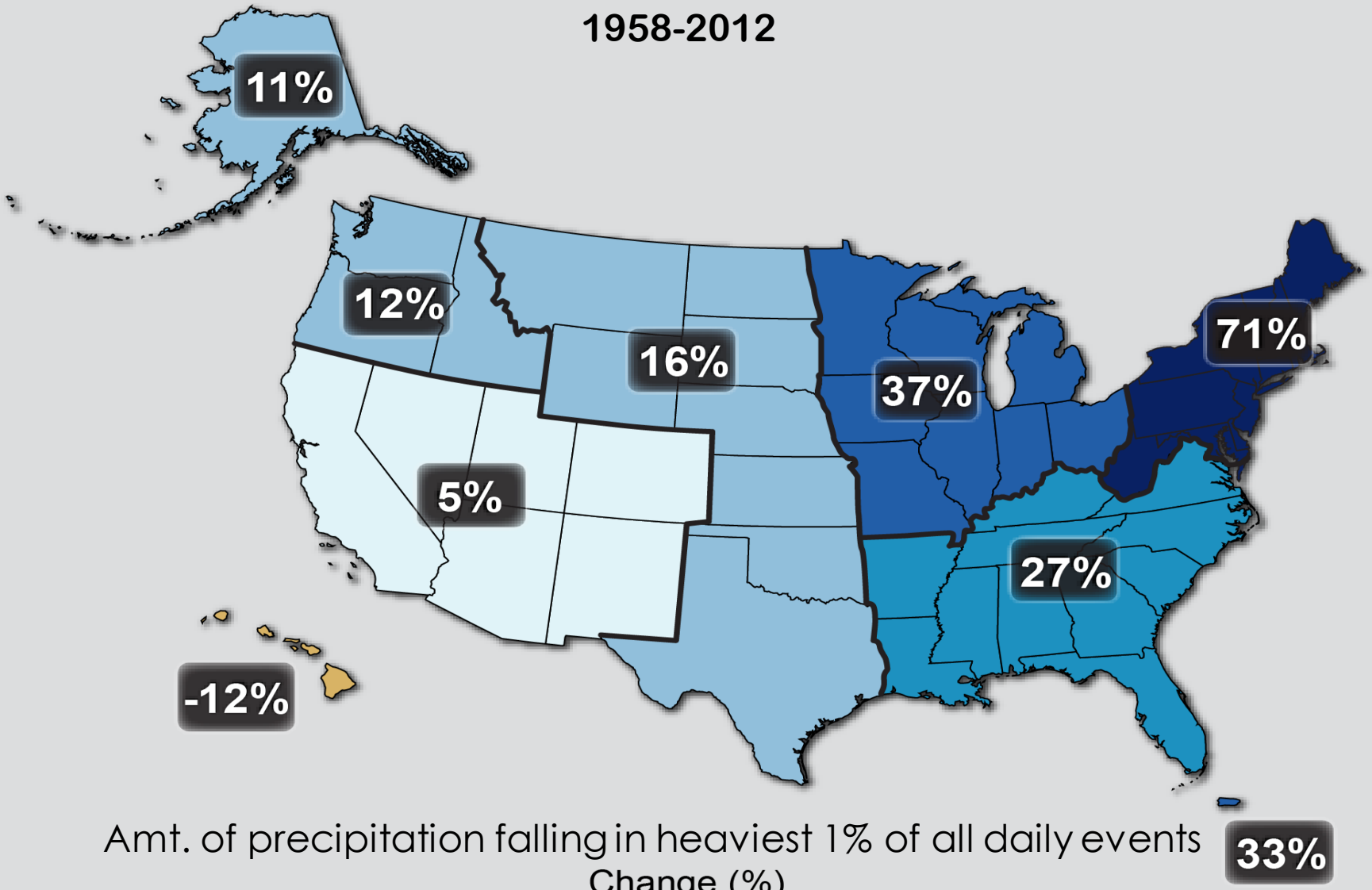
Flood Fringe = More Shallow and Slower Floodwaters




Land area inundated by the base flood, or the area affected in the 1% annual chance flood, aka the "100 year" floodplain

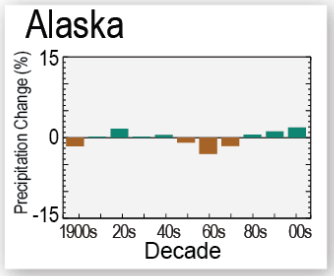
# FLOODPLAIN MANAGEMENT PRINCIPLES

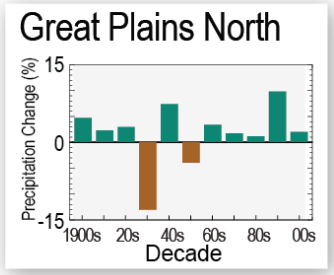
# Observed Change in Very Heavy Precipitation

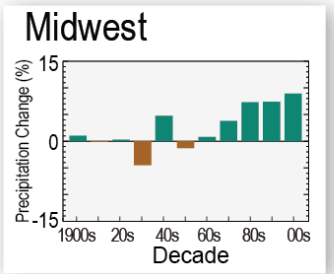


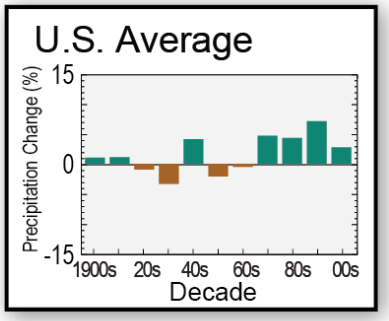

Source: National Climate Assessment website @GlobalChange.gov

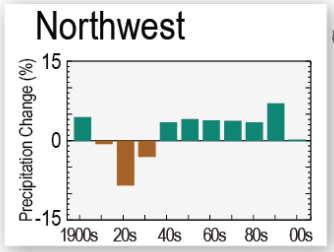
# Observed U.S. Precipitation Change
## 1/1/1901 - 12/31/2012

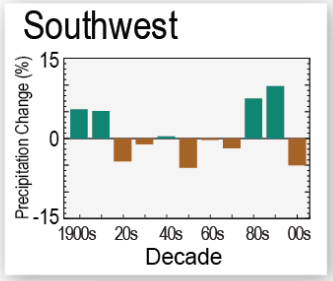


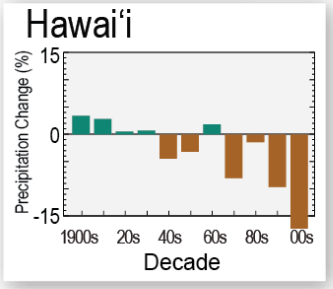



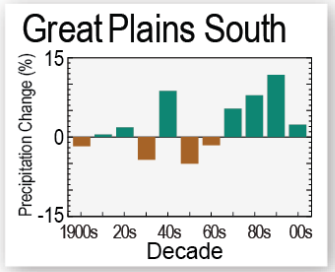



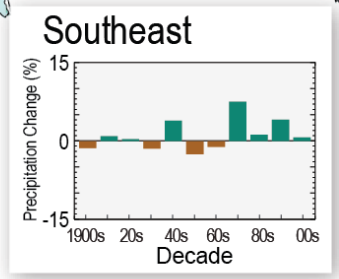



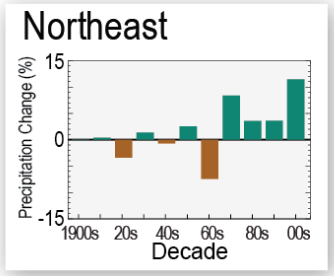



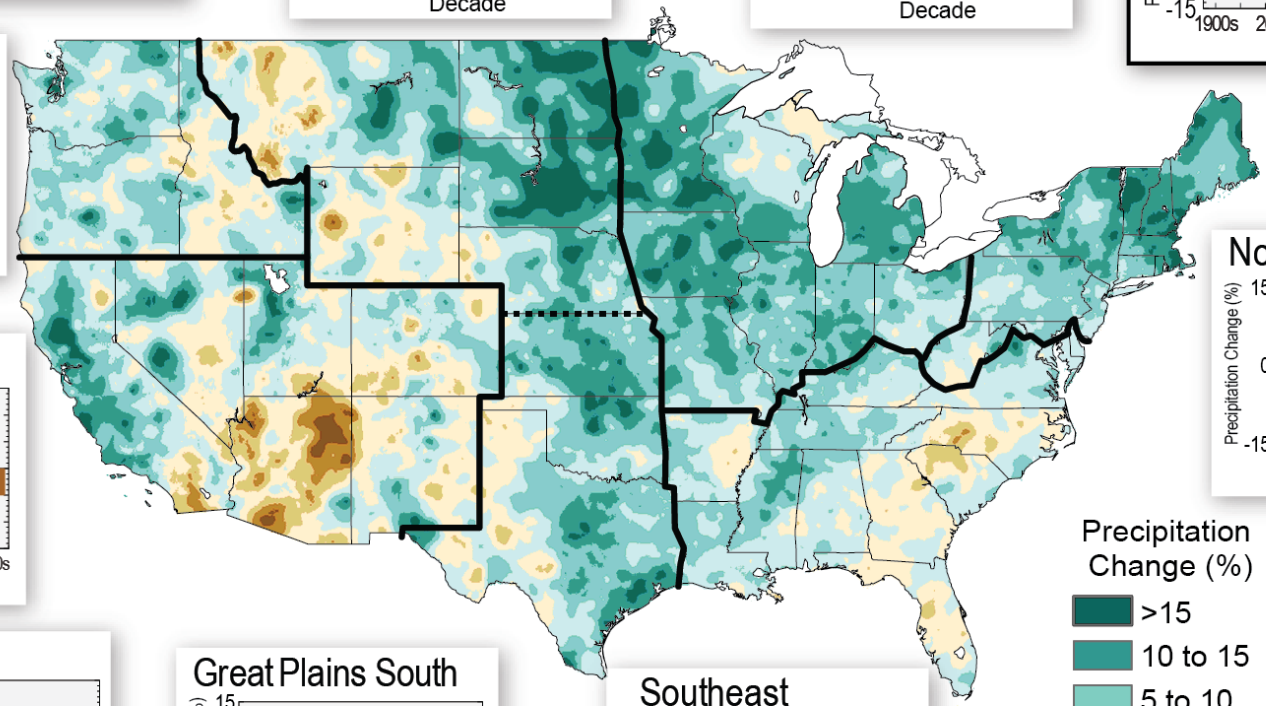



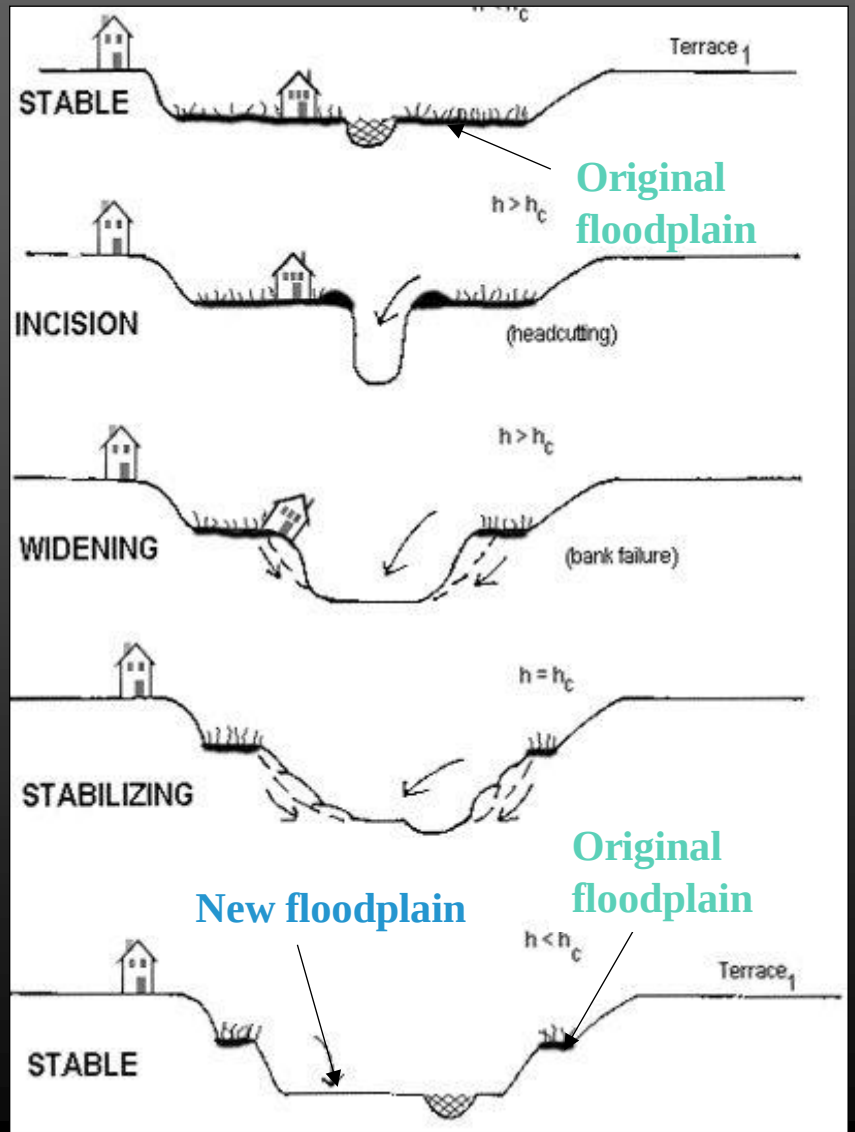
Precipitation Change (%)

- >15
- 10 to 15
- 5 to 10
- 0 to 5
- -5 to 0
- -10 to -5
- -15 to -10
- <-15

**Source: *National Climate Assessment* website @GlobalChange.gov**

# INUNDATION VS. EROSION FLOODING

# FLOODPLAIN CONNECTIVITY




# FLOODPLAINS…

…dissipate water energy & reduce flashiness

Mad River, Moretown, during and after Irene
Photo Credit: David Cain

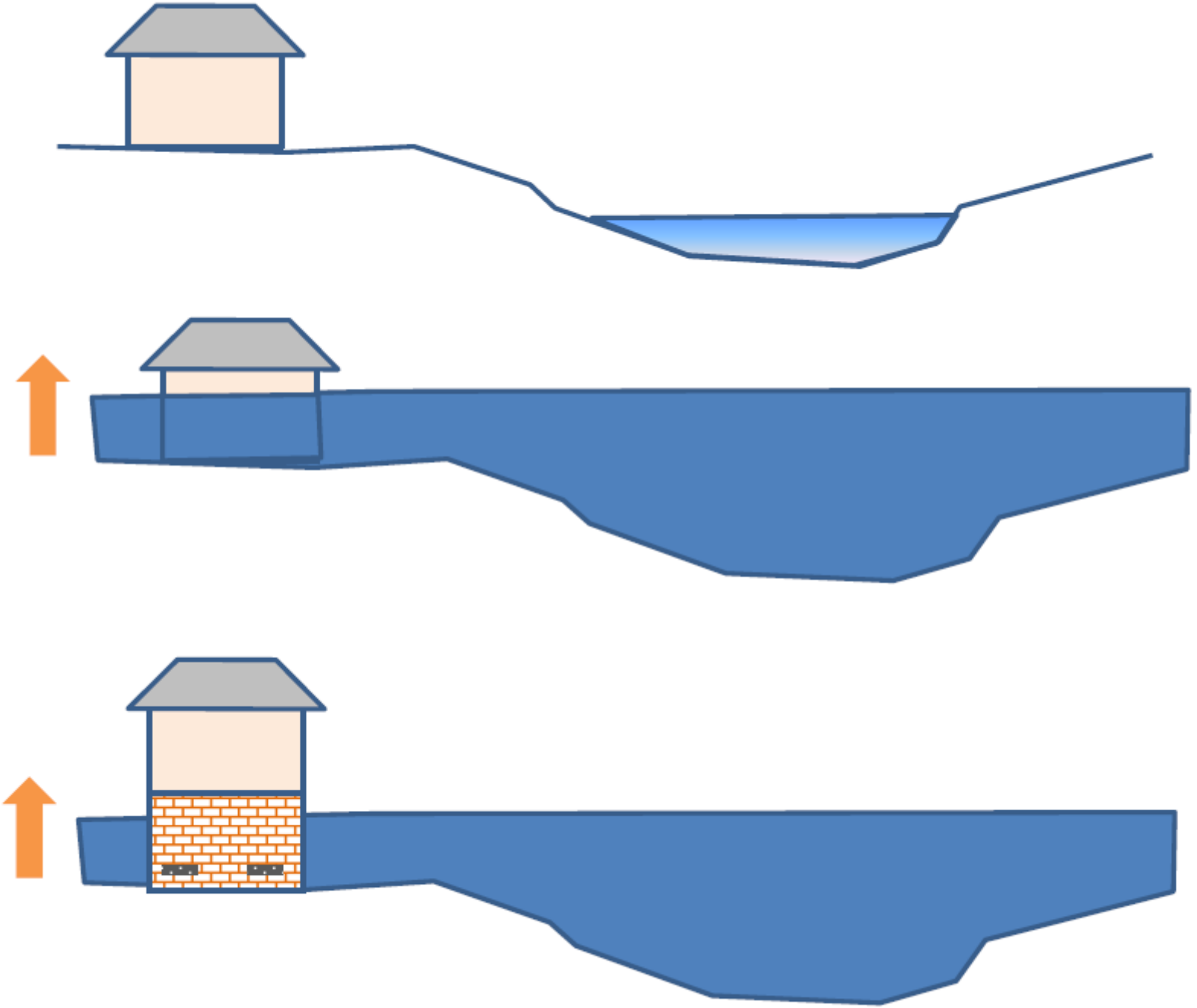
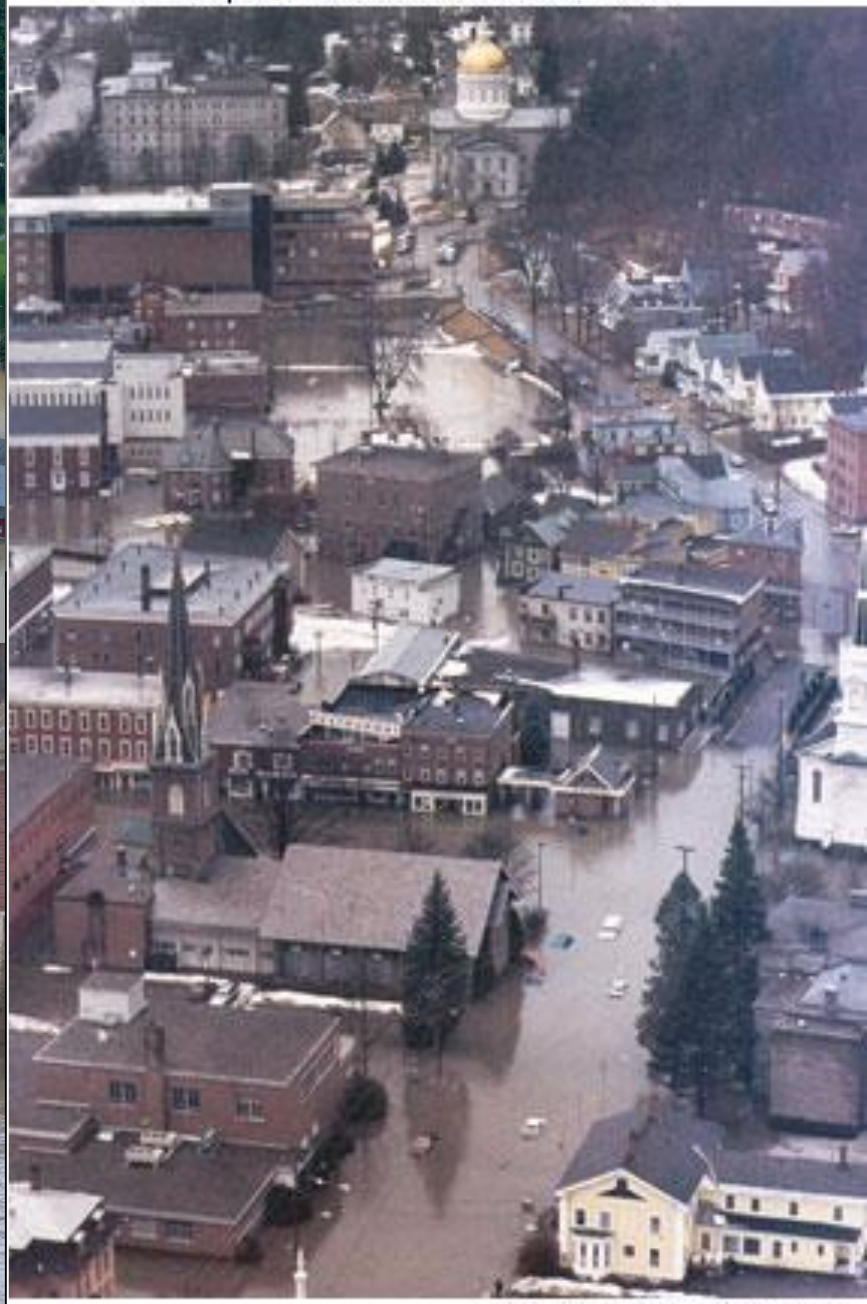


Photo: NASA Applied Sciences
https://appliedsciences.nasa.gov/what-we-do/disasters/disasters-activations/vermont-flooding-july-2023


Jeffersonville, VT
Photo: Tammy Fenton

Aerial view of the Montpelier 1992 flood.
Cover photo of the *Ice and Water* book.

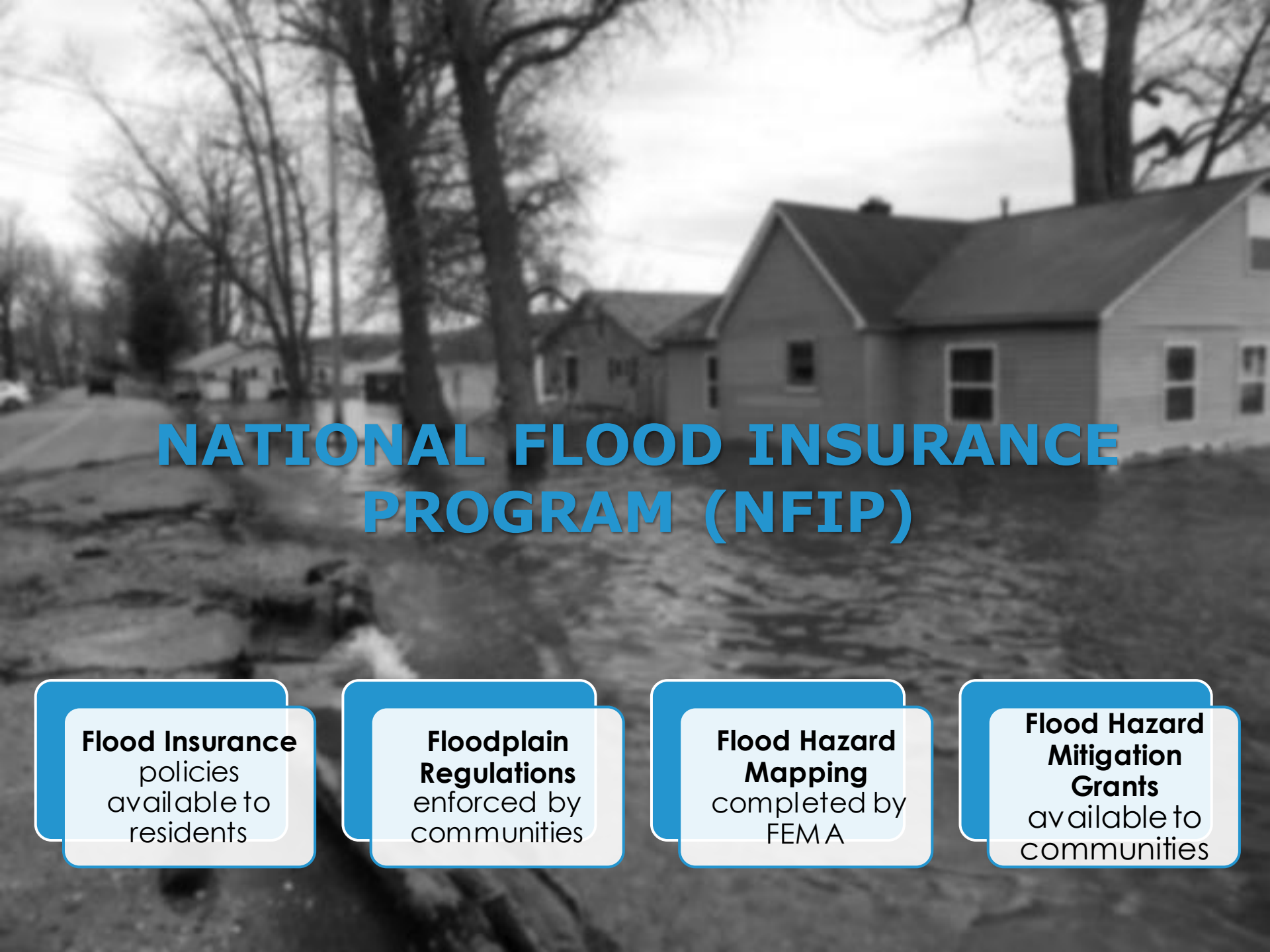


Jim Cole, Associated Press

FEMA

NATIONAL FLOOD INSURANCE PROGRAM®

# NATIONAL FRAMEWORK FOR FLOODPLAIN MANAGEMENT



# NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

**Flood Insurance** policies available to residents

**Floodplain Regulations** enforced by communities

**Flood Hazard Mapping** completed by FEMA

**Flood Hazard Mitigation Grants** available to communities

# Communities must **adopt**, **implement** & **enforce** flood hazard area regulations

**Protection of public safety**


**Reduce future flood damages & suffering**

# VERMONT STATE FLOODPLAIN MANAGEMENT PROGRAM ROLE

Training, Education & Outreach

Permitting:

FHARC rule

(state facilities, ag, Power transmission & generation)

Technical Support:

Act 250 review and Recommendations under Criterion 1D

Municipal support:

Post-flood permitting and damage assessment assistance

Municipal support:

Recommended model regulations for communities

Municipal support:

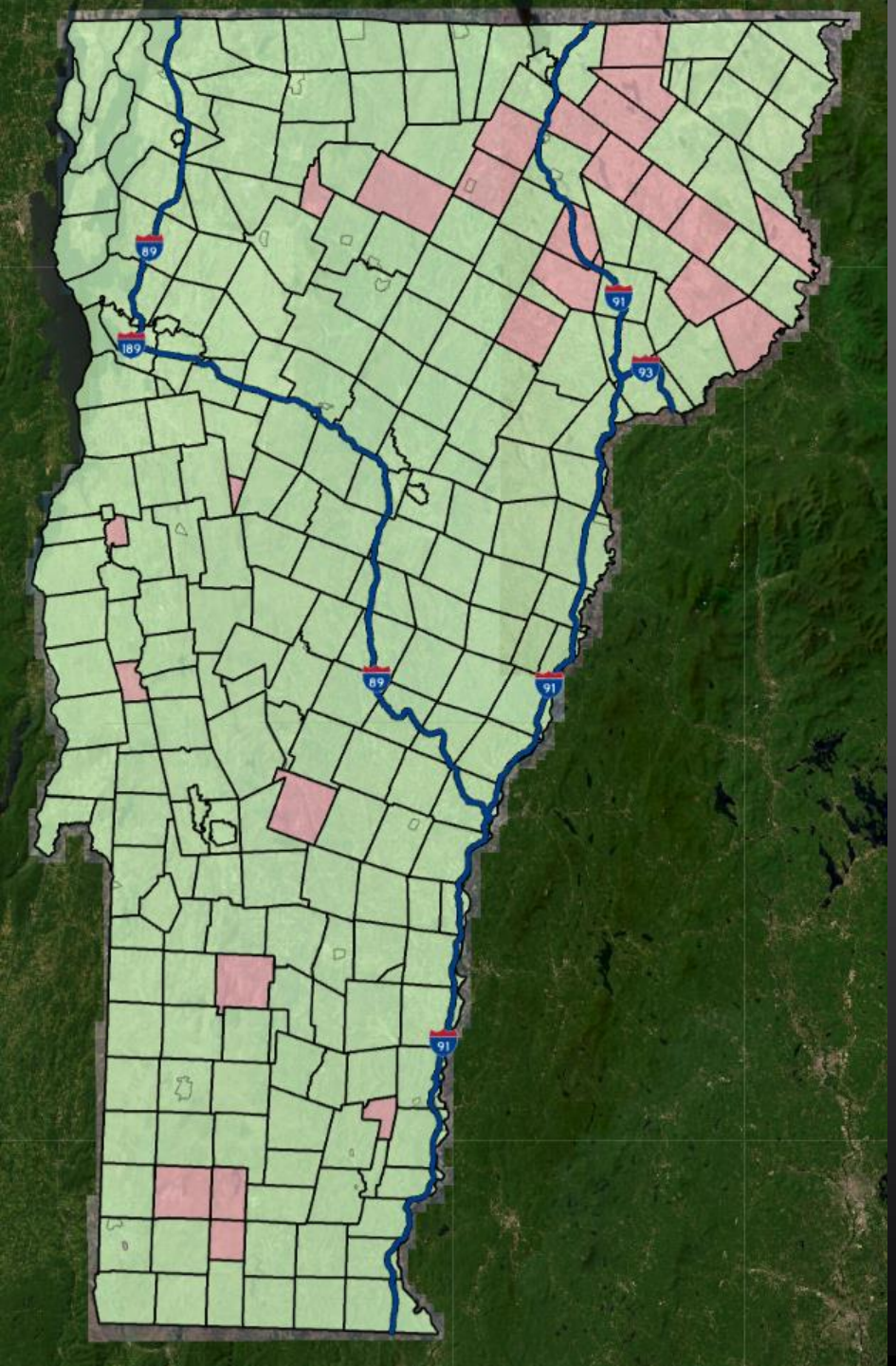
Review floodplain development for compliance (24 VSA §4424)

*Flood Ready*

*Come to discuss opportunities to make*

# Vermont NFIP Participation

## 1/2024




Legend

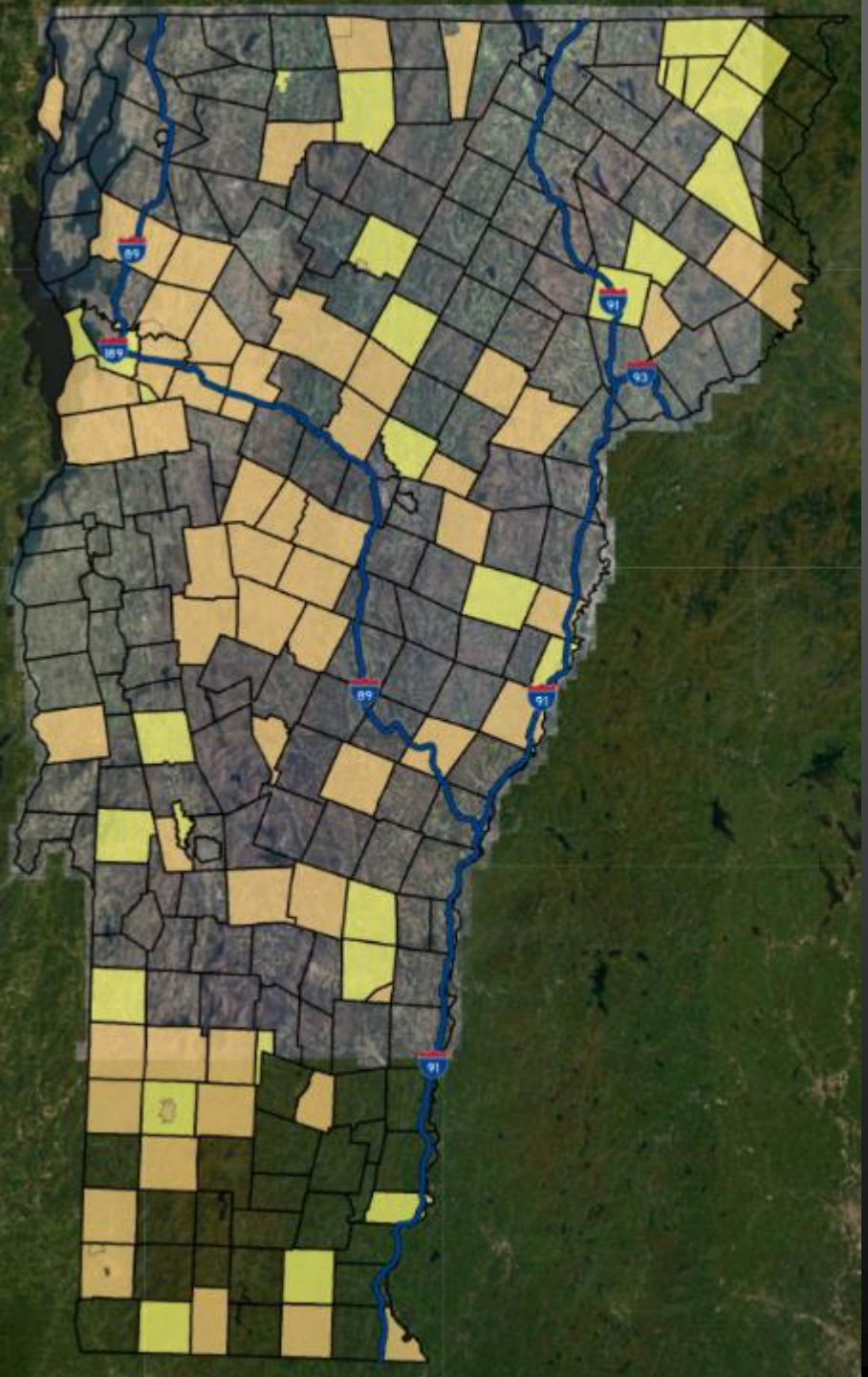
National Flood Insurance Program

274 Communities — Participating Community

20 Communities — Not Participating

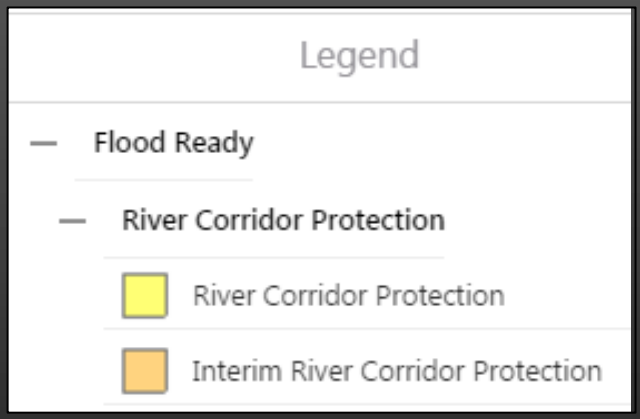
List of NFIP Participating communities available at:
https://www.fema.gov/cis/VT.html

Map available from:
Flood Ready Vermont Atlas



# River Corridor & Floodplain Protection Regulations

## 1/2022




Map available from:
Flood Ready Vermont Atlas

# Every Municipality has different flood hazard standards

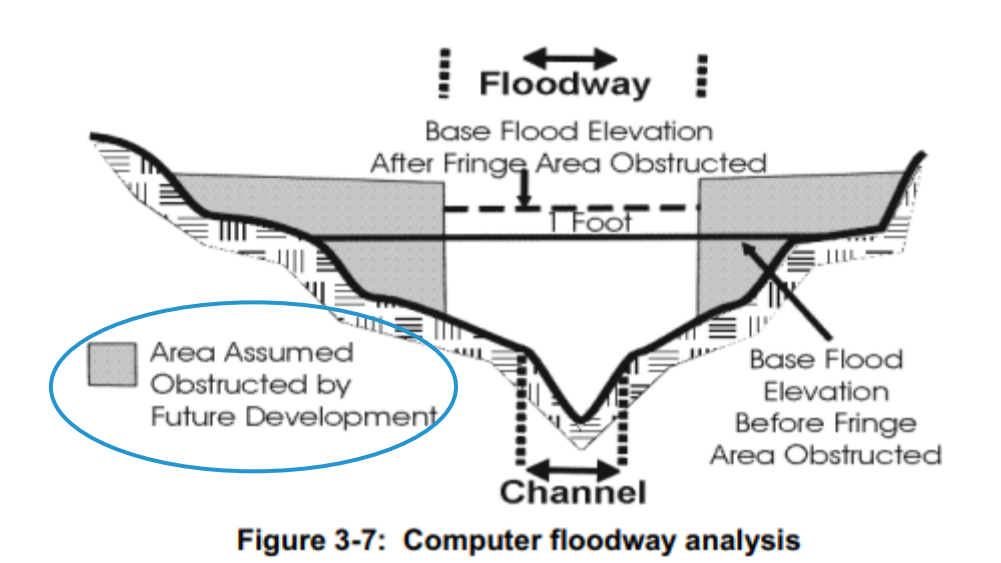



**Figure 3-7: Computer floodway analysis**

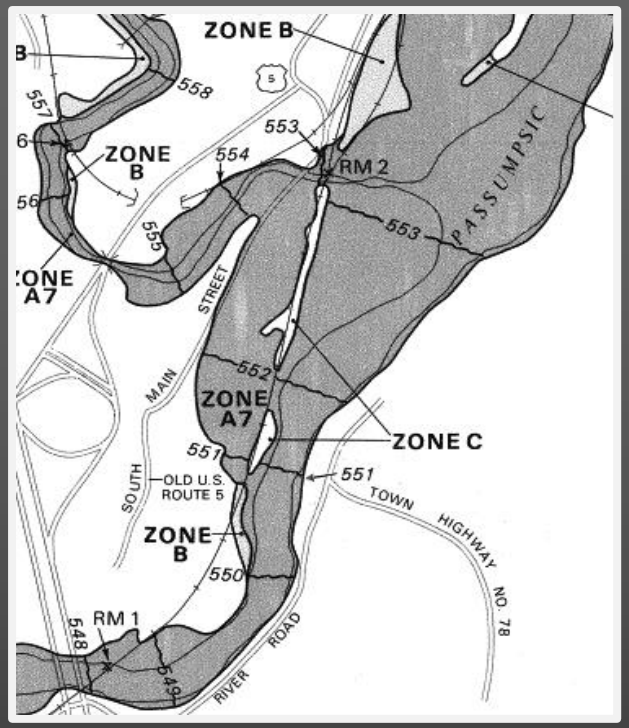
From FEMA 480: NFIP Floodplain Management Requirements Desk Reference

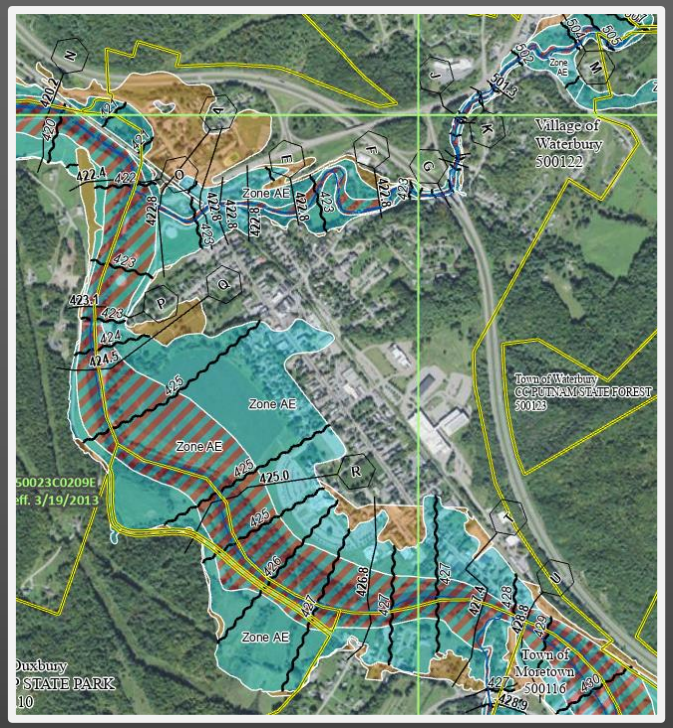
Over 80% of Vermont towns have higher flood hazard standards

Many only minimally exceed FEMA minimum requirements

FEMA minimum standards ALLOW for new development to increase flood heights

FEMA minimum standards DO NOT protect floodplain function

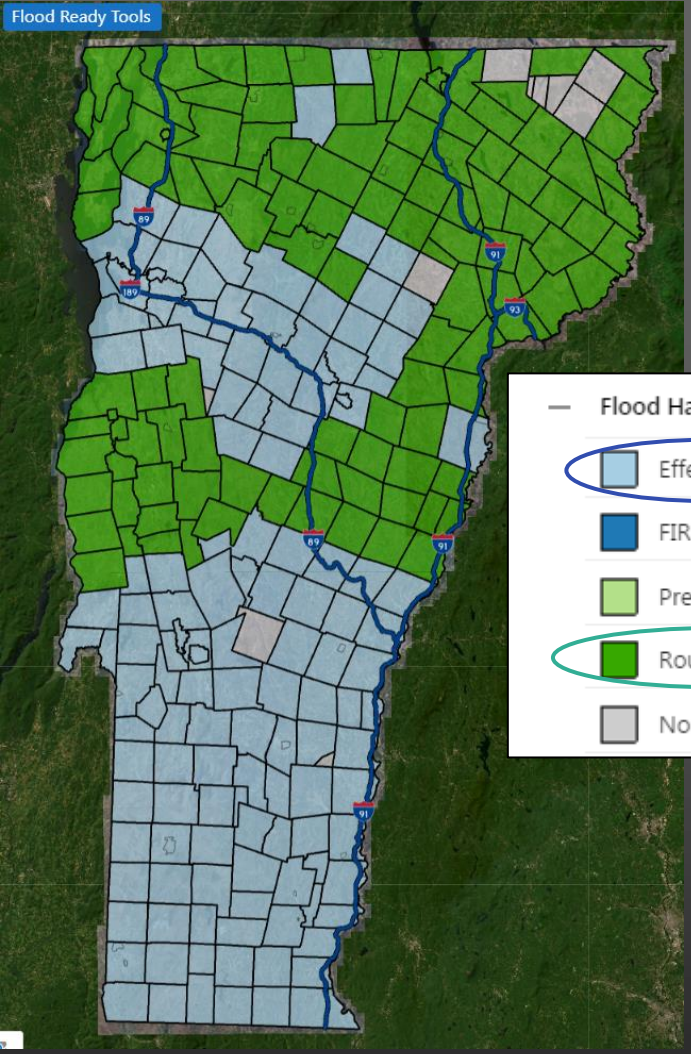



# NFIP FLOOD HAZARD MAPS

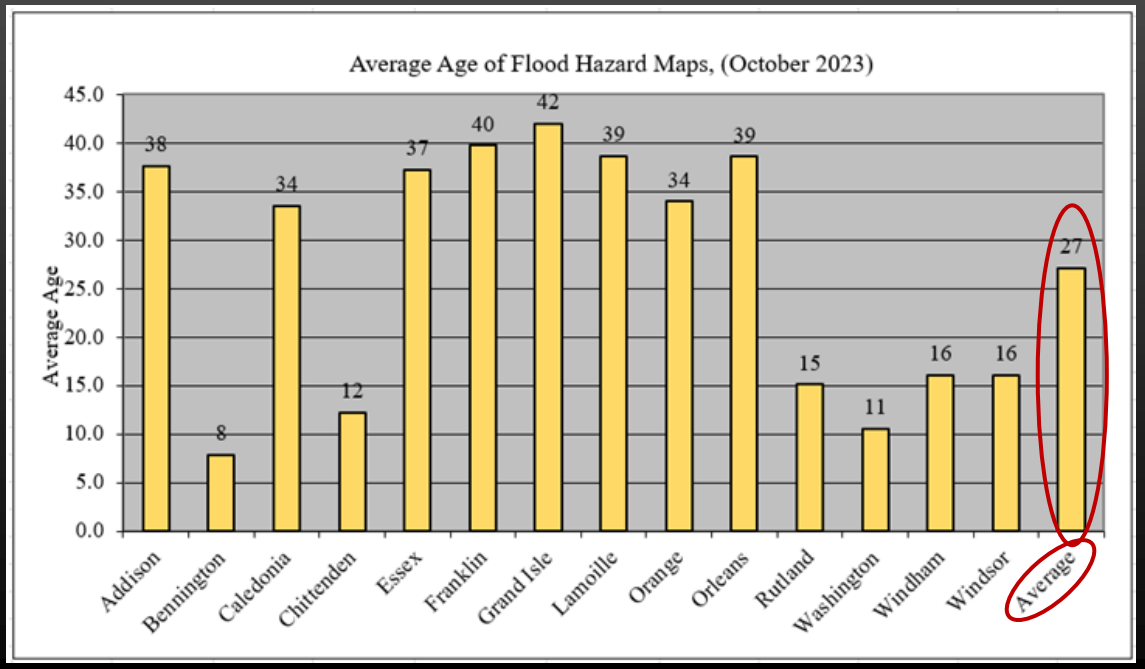
# FEMA Flood Insurance Rate Map (FIRM) Status

10/2023



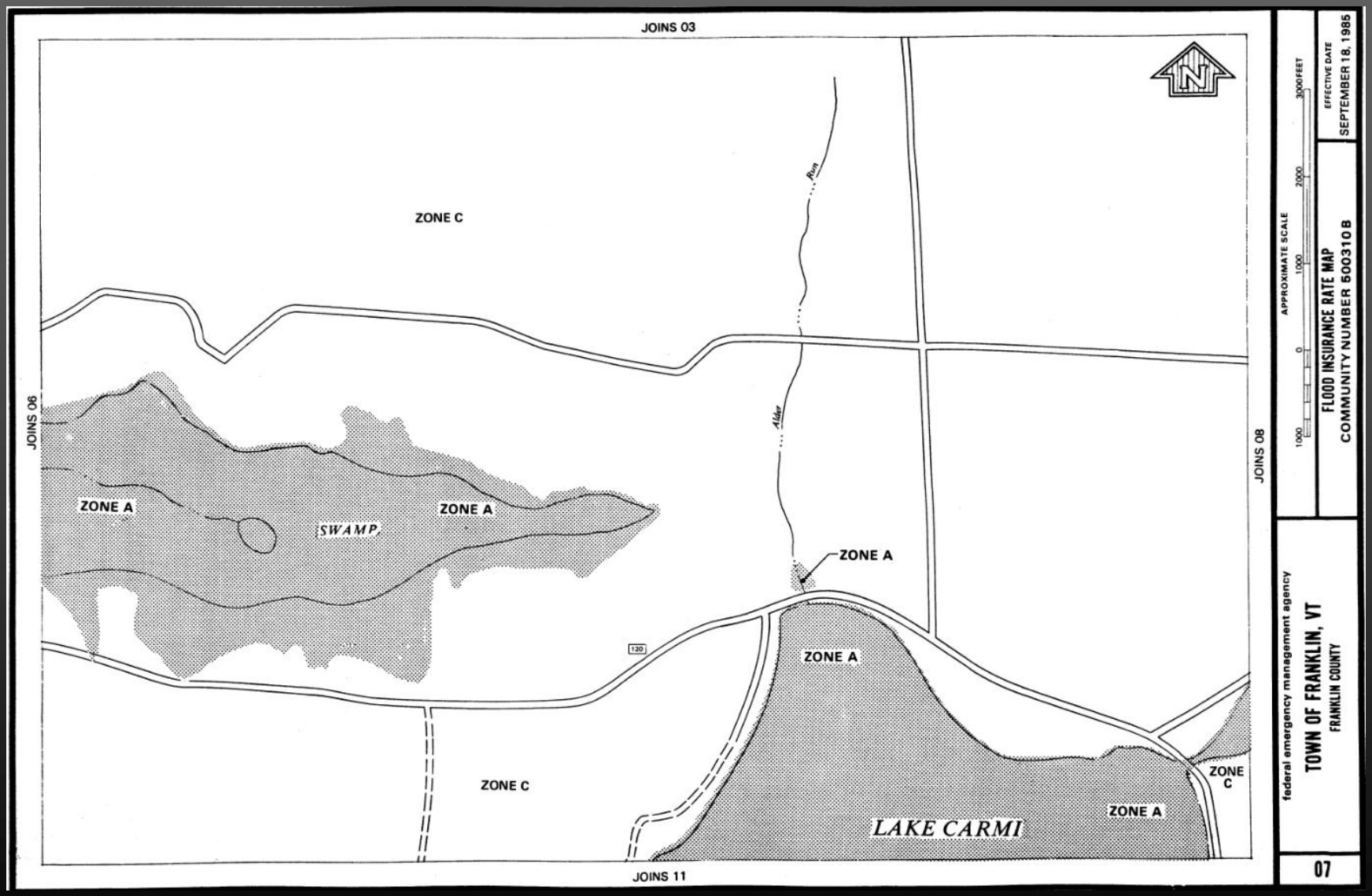

Available on Atlas

Available at msc.fema.gov



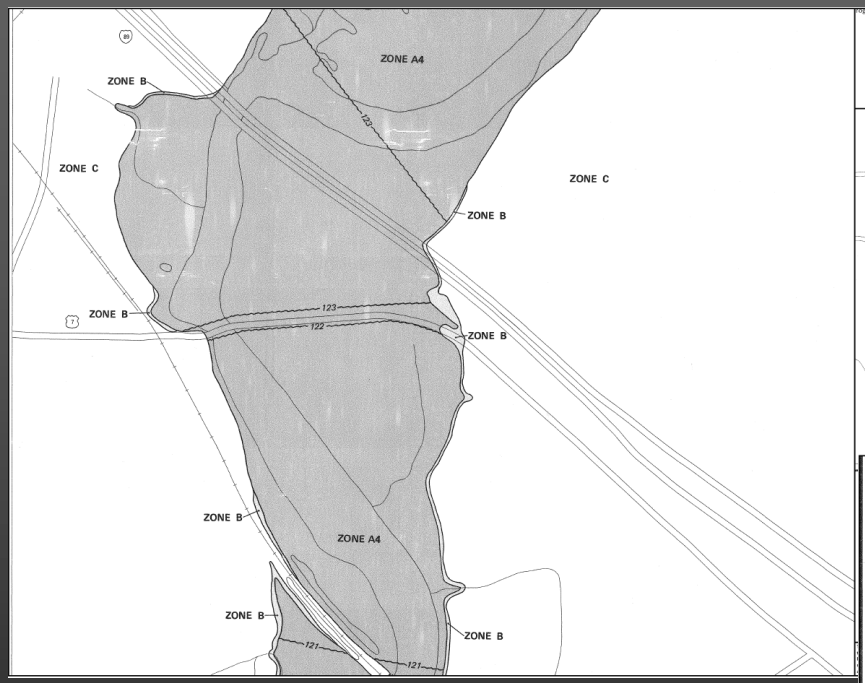
# FLOOD HAZARD BOUNDARY MAPS

## (MAY STILL BE THE MAPS FOR FRANKLIN COUNTY OR THE NEK)

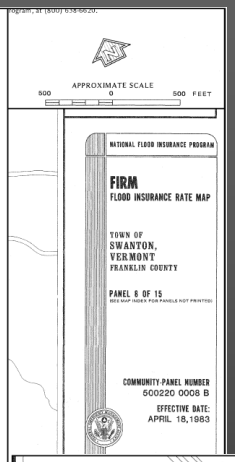


# 1980'S VINTAGE FLOOD MAPS

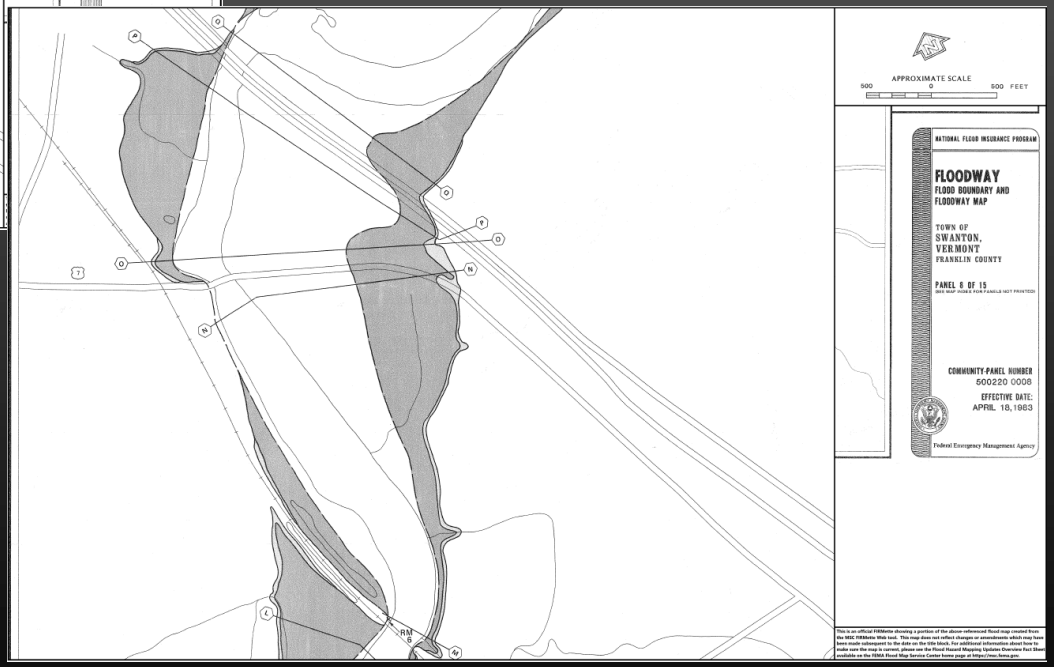
## (STILL THE MAPS FOR ABOUT 1/3 OF VERMONT COUNTIES)



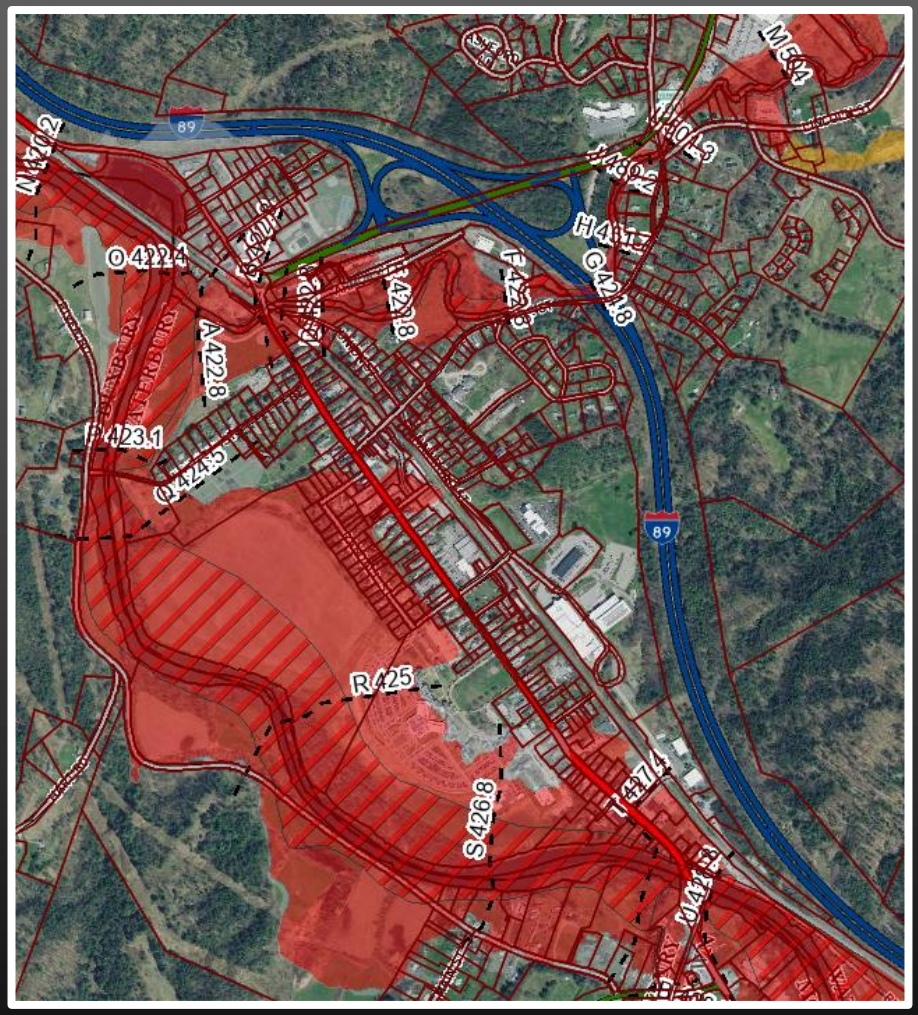

Flood Insurance Rate Map (FIRM)



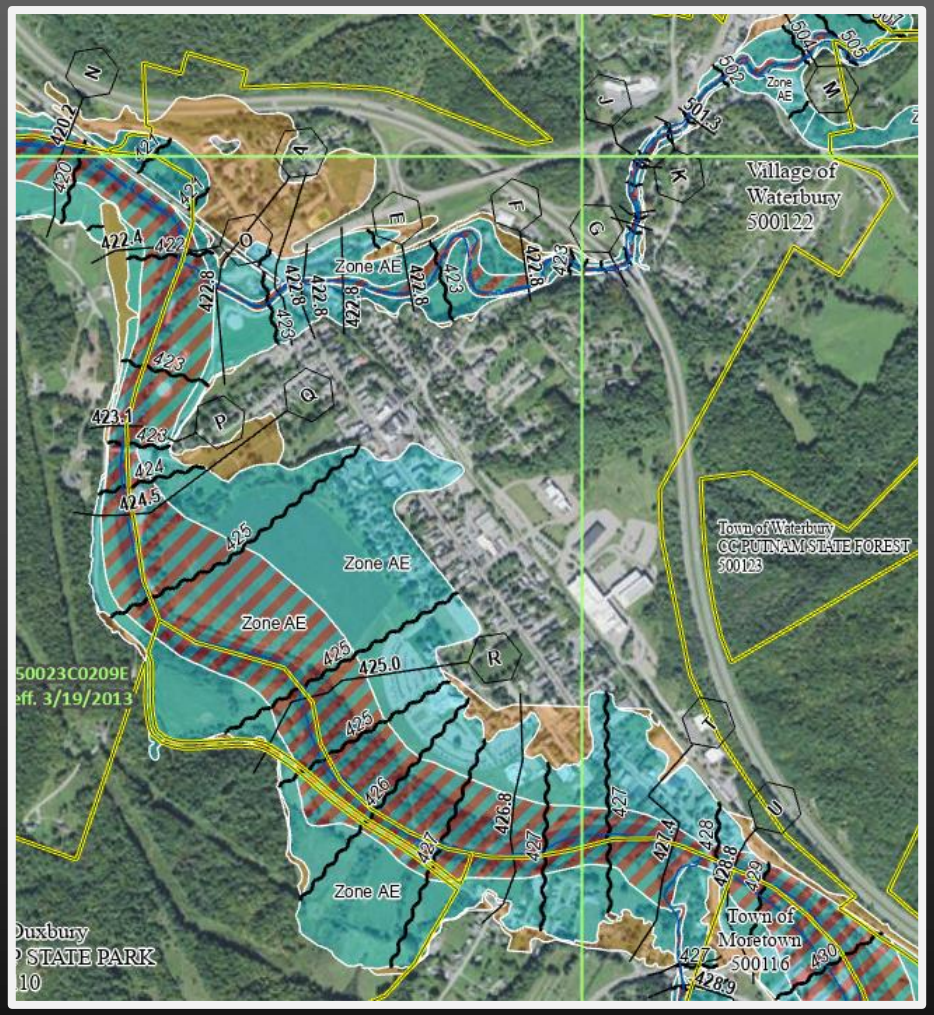

Flood Boundary & Floodway Map (FHBM)



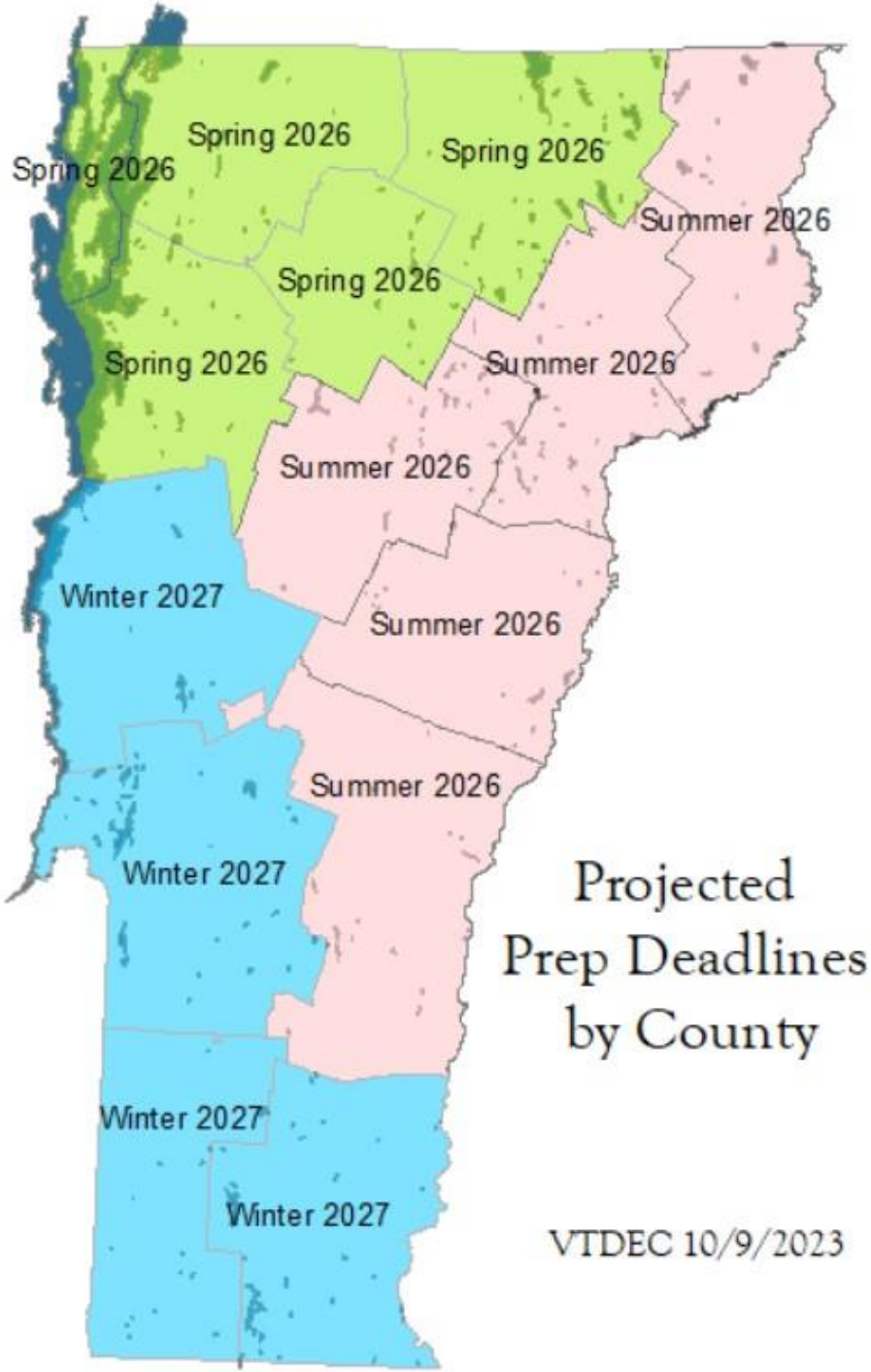
# DIGITAL FLOOD INSURANCE RATE MAP (DFIRM)



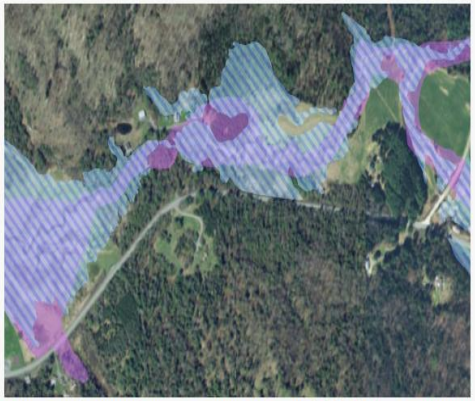

VT ANR Natural Resource Atlas




FEMA's Map Service Center




# GET READY FOR NEW FEMA MAPS

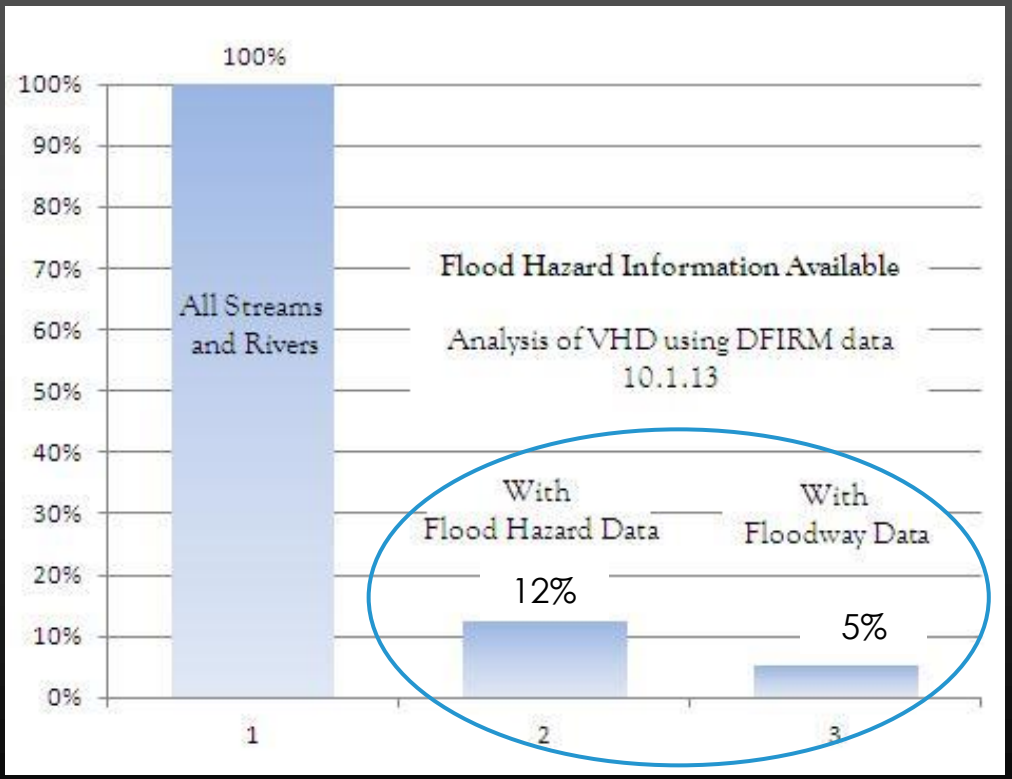


In this example, the purple areas are current Zone A and the blue lined areas are proposed new Zone A. Notice that the new Zone A is more detailed and often changes which areas of land are considered at a high risk of flooding.

*Prep deadline is approximately 4 months prior to new map effective dates

https://floodtraining.vermont.gov/protection-tools/get-ready-new-fema-flood-insurance-rate-maps#status

# MANY VT FLOOD RISKS ARE NOT IDENTIFIED BY NFIP MAPS




Unnamed Tributary, White River, 2007

**Inundation Hazard Mapping in 5 Vermont Counties**

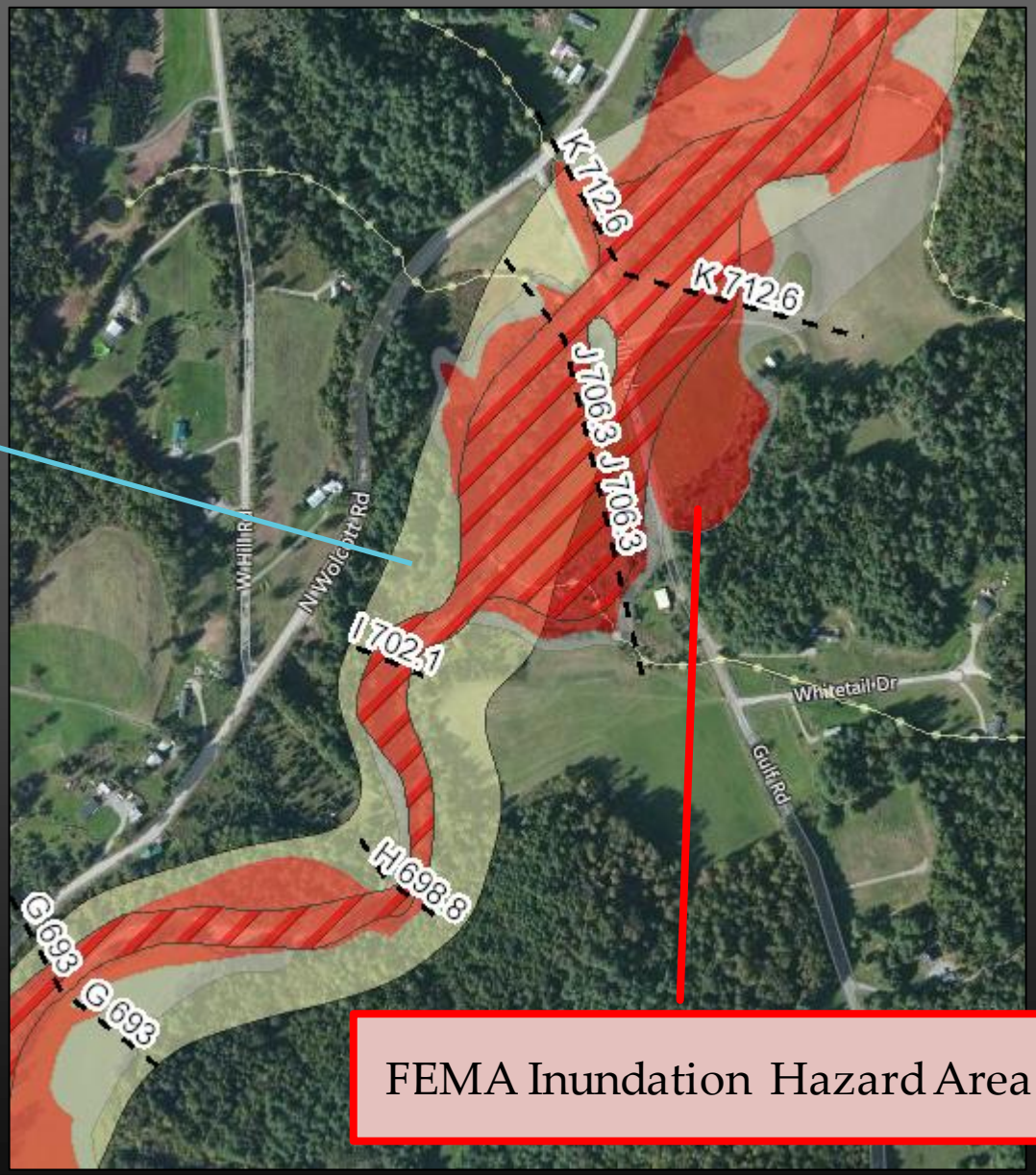
# MOVING BEYOND THE NFIP:

## INTEGRATING RIVER CORRIDOR & INUNDATION FLOODPLAIN PRINCIPLES

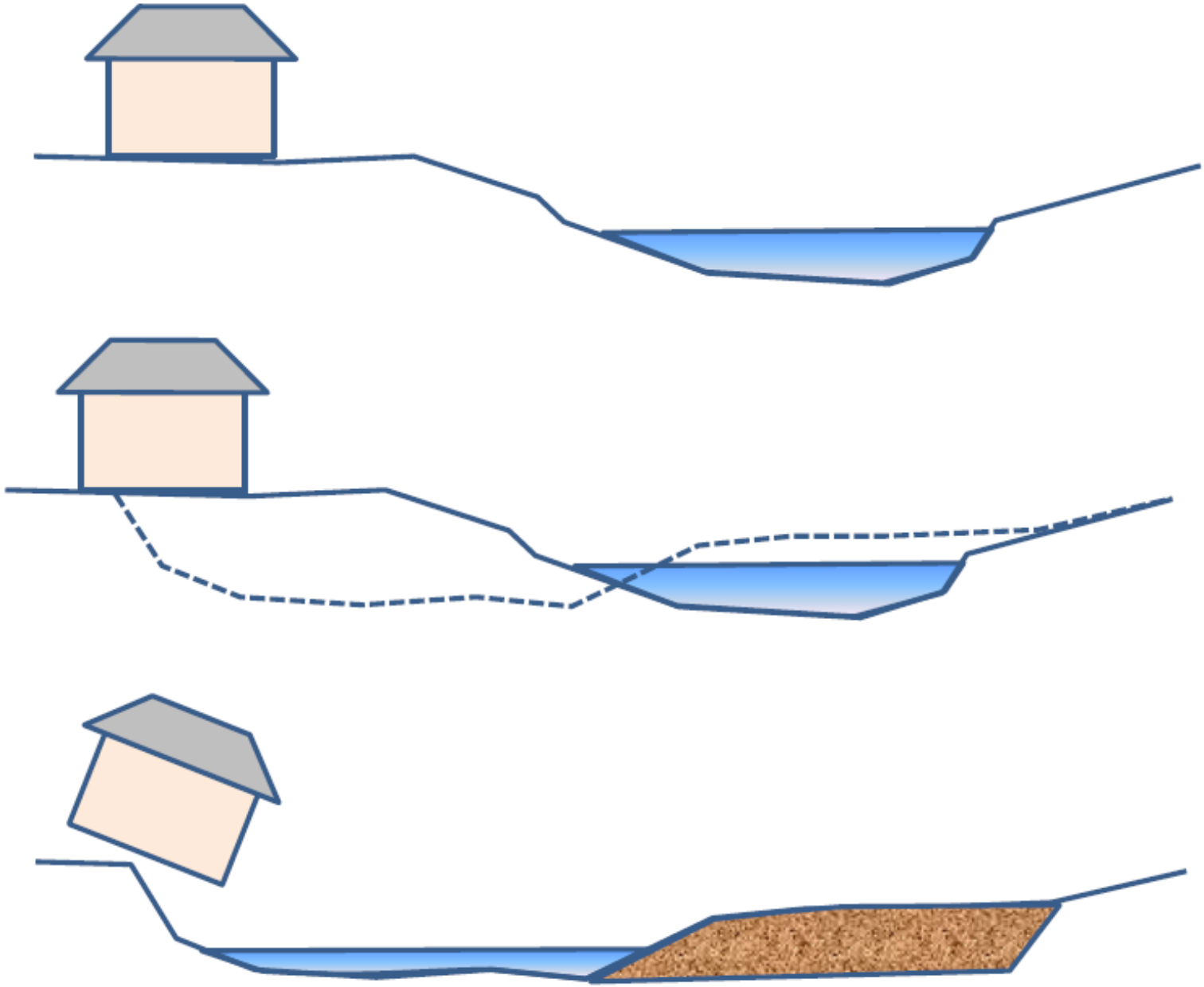
# PROTECTION OF FLOODPLAINS & RIVER CORRIDORS

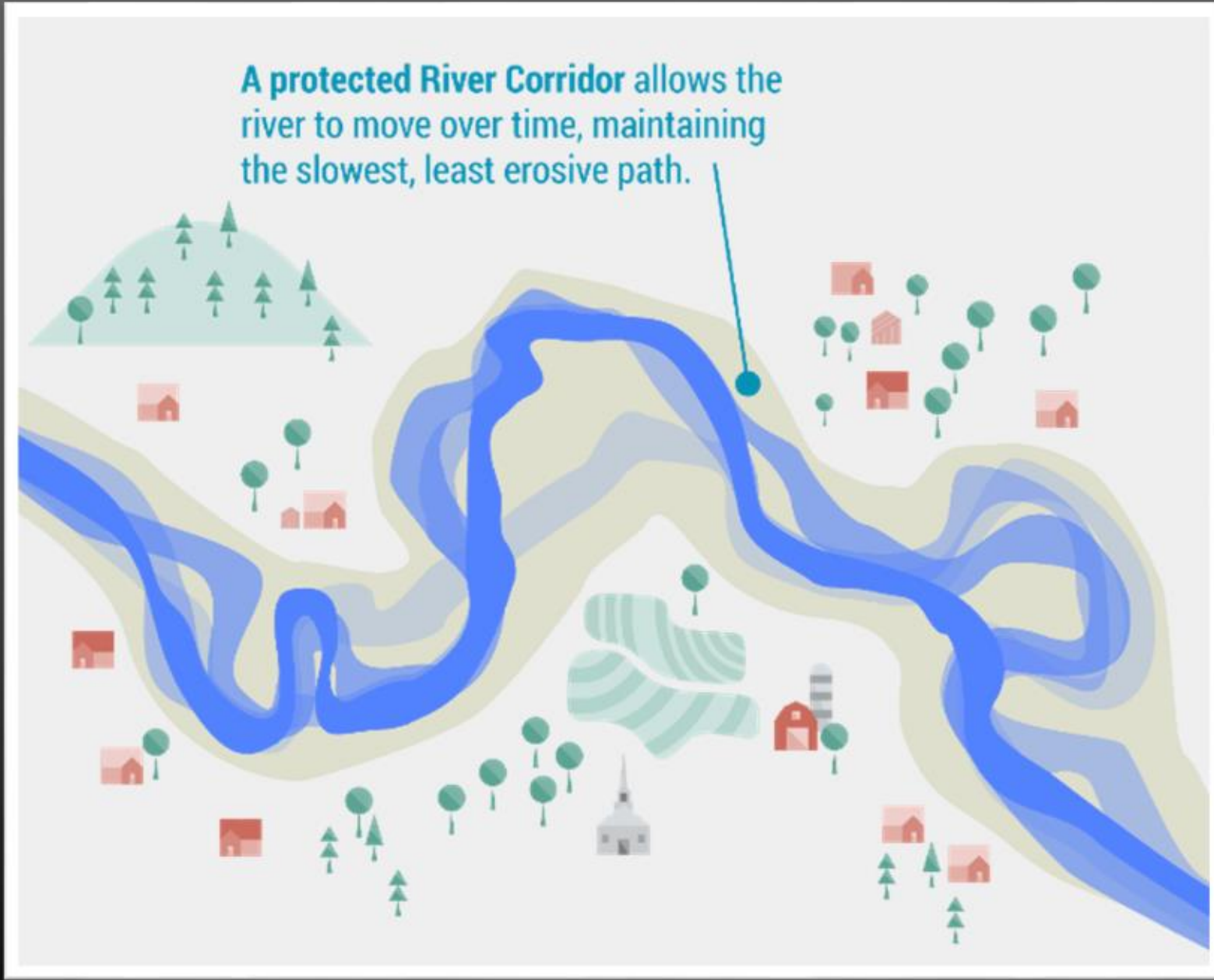
ANR River Corridor

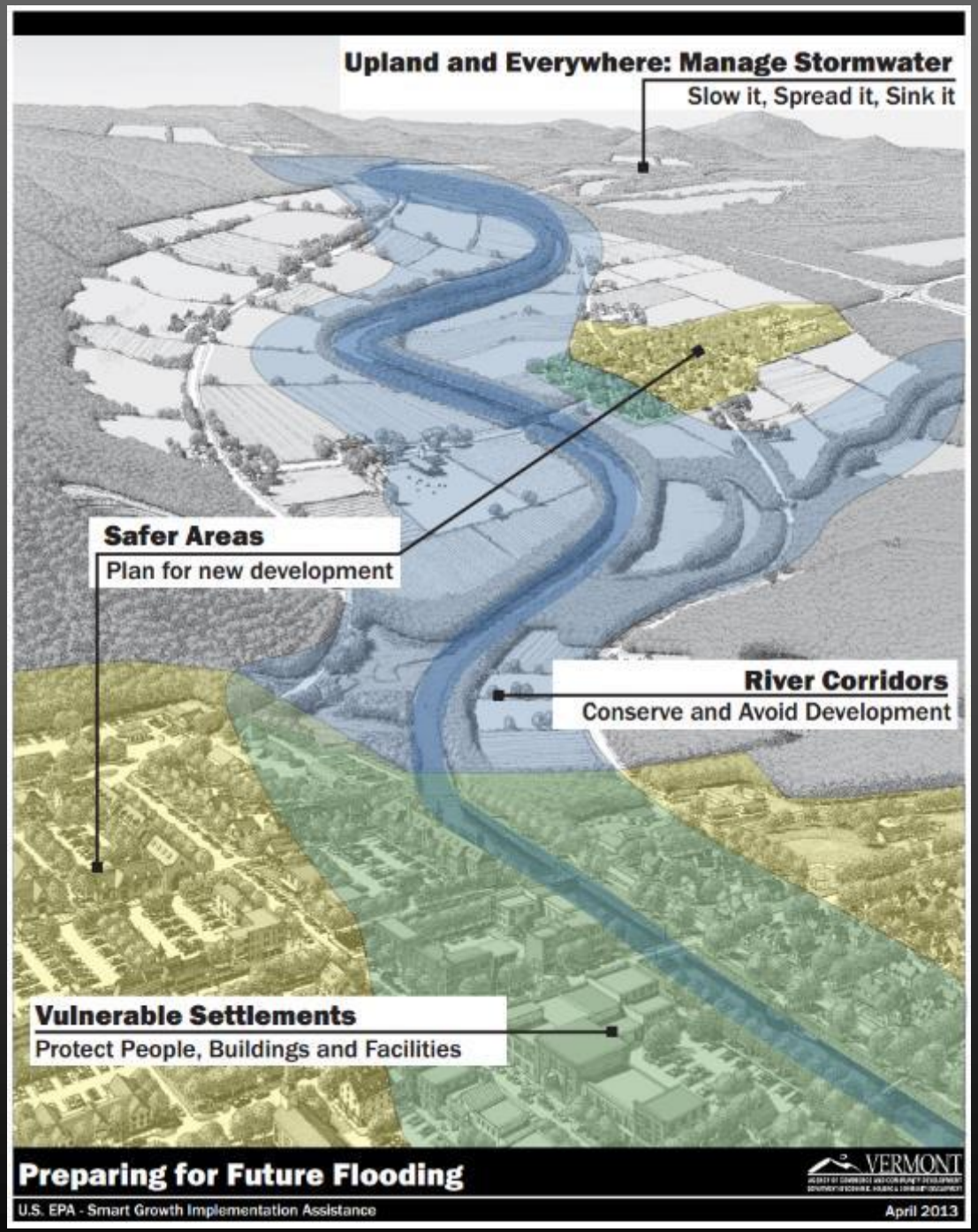
- The Vermont Agency of Natural Resources has statewide mapping available of River Corridors
- River Corridors account for future river erosion and adjustment




ANR Natural Resource Atlas
http://anrmaps.vermont.gov/websites/anra5/




**A protected River Corridor** allows the river to move over time, maintaining the slowest, least erosive path.




A *Resilient Landscape* has space for dynamic natural processes

A *Resilient Community* can learn and adapt

The Flood Resilience Checklist for Vermont Communities at: https://floodready.vermont.gov/update_plans

# Align and Protect Public Values

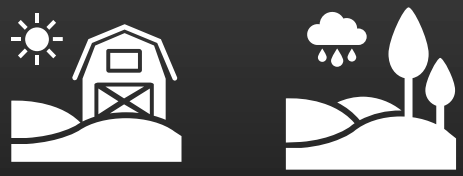
# VERMONT'S FLOOD HAZARD AREA & RIVER CORRIDOR (FHARC) RULE:

## NO ADVERSE IMPACT (NAI) FLOOD HAZARD MANAGEMENT

# STATE FLOOD HAZARD AREA & RIVER CORRIDOR (FHARC) RULE

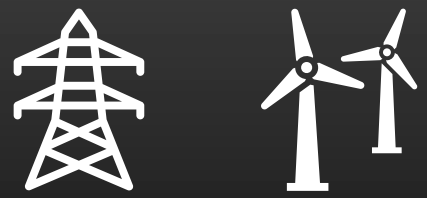
STATE-OWNED AND OPERATED BUILDINGS AND FACILITIES

# STATE FLOOD HAZARD AREA & RIVER CORRIDOR (FHARC) RULE

ACCEPTED AGRICULTURAL & SILVICULTURAL PRACTICES

# STATE FLOOD HAZARD AREA & RIVER CORRIDOR (FHARC) RULE

PUBLIC POWER GENERATION & TRANSMISSION (PUC)

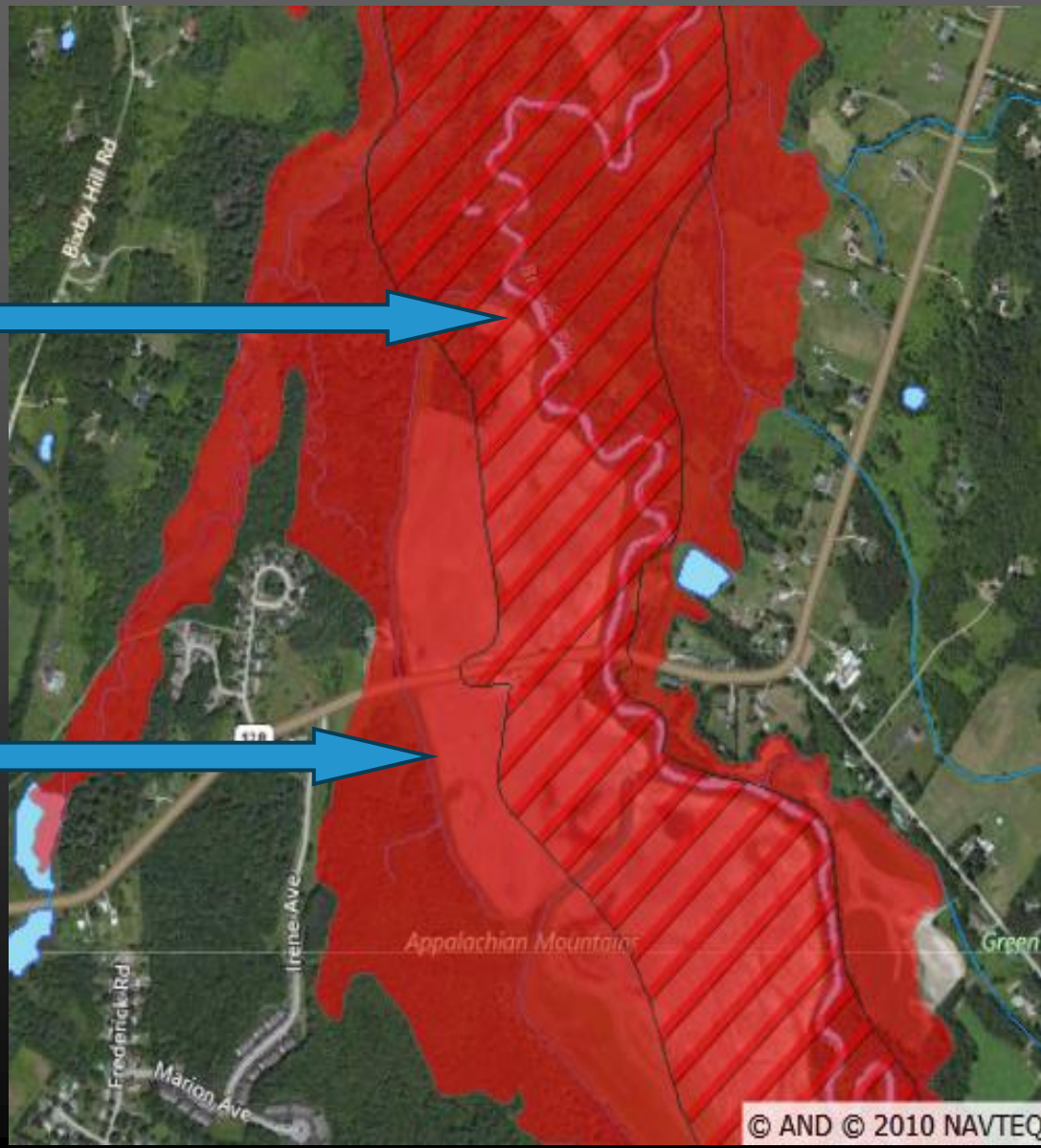
# NO ADVERSE IMPACT (NAI) STANDARDS: INUNDATION

FEMA Floodways

NO INCREASE IN BASE FLOOD ELEVATION OR *VELOCITY*

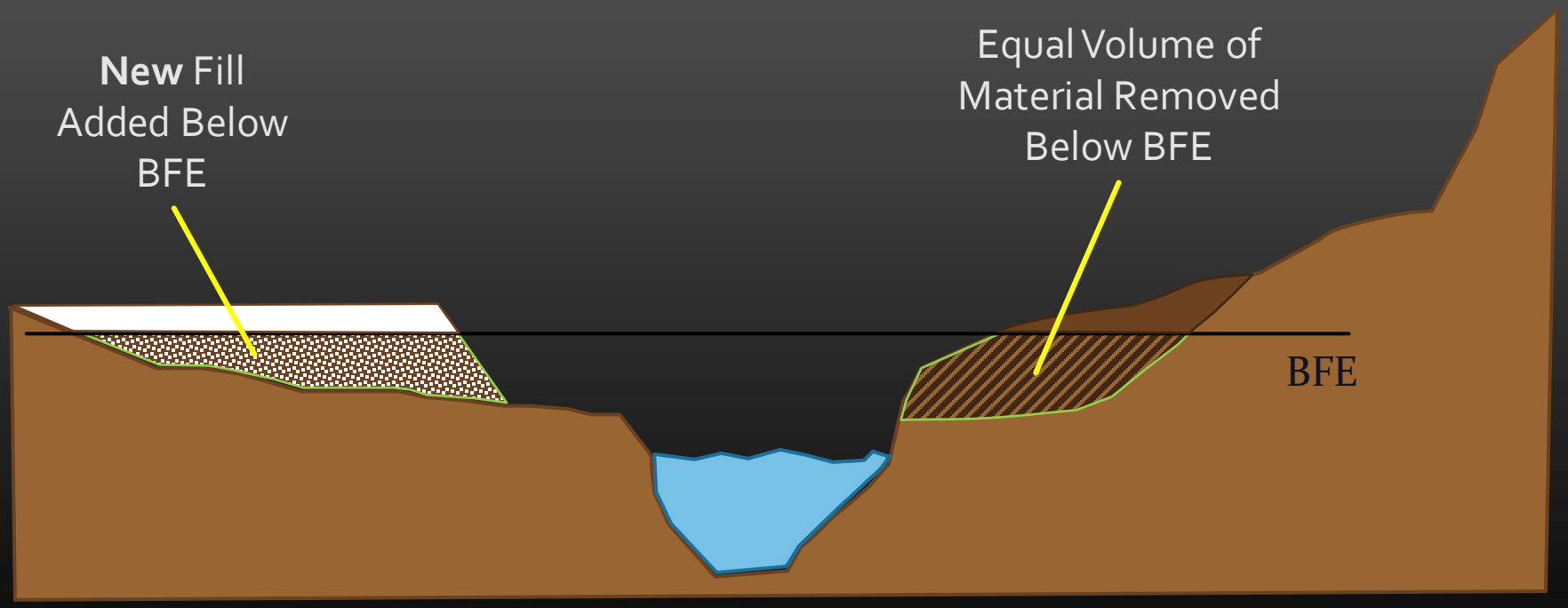
Entire Flood Hazard Area

- NO LOSS OF FLOOD STORAGE VOLUME
- STRUCTURES ELEVATED 2’ ABOVE BFE
- CRITICAL FACILITIES ELEVATED TO THE 0.2% ANNUAL CHANCE FLOOD ELEVATION



# NO ADVERSE IMPACT (NAI) STANDARDS: INUNDATION

## COMPENSATORY STORAGE IN FLOOD FRINGE



# NO ADVERSE IMPACT (NAI) STANDARDS:
## RIVER CORRIDOR

BUILD NO CLOSER TO THE RIVER WHERE DEVELOPMENT EXISTS

Preserve space still available

Rebecca Pfeiffer, CFM
Vermont NFIP Coordinator;
State Floodplain Manager
Rebecca.Pfeiffer@vermont.gov, 802-490-6157

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
RIVERS PROGRAM

# Visit:

## MORE INFORMATION

For complete details on Substantial Damage requirements, see FEMA's Substantial Improvement/ Substantial Damage Desk Reference Guide (P-758):
*www.fema.gov/media-library/assets/documents/18562*

For more resources for local officials, please go to VTDEC's ***After the Flood*** website:

https://dec.vermont.gov/watershed/rivers/river-corridor-and-floodplain-protection/after-a-flood

For questions, please contact your local VT DEC Regional Floodplain Manager at:

https://dec.vermont.gov/sites/dec/files/wsm/rivers/docs/floodplain_mngr_regions.pdf

Flood Ready Vermont (River Corridor FAQs, ERAF & More) :
http://Floodready.Vermont.gov

Vermont Rivers Program (Municipal Assistance):
http://watershedmanagement.vt.gov/rivers/htm