

**Vermont's No Adverse
Impact (NAI) Approach to
Floodplain Management**

VERMONT
AGENCY OF NATURAL RESOURCES
Respect. Protect. Enjoy.

**VERMONT DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
WATERSHED
MANAGEMENT DIVISION
RIVERS PROGRAM**

**Prepared for the House
Committee on Environment**

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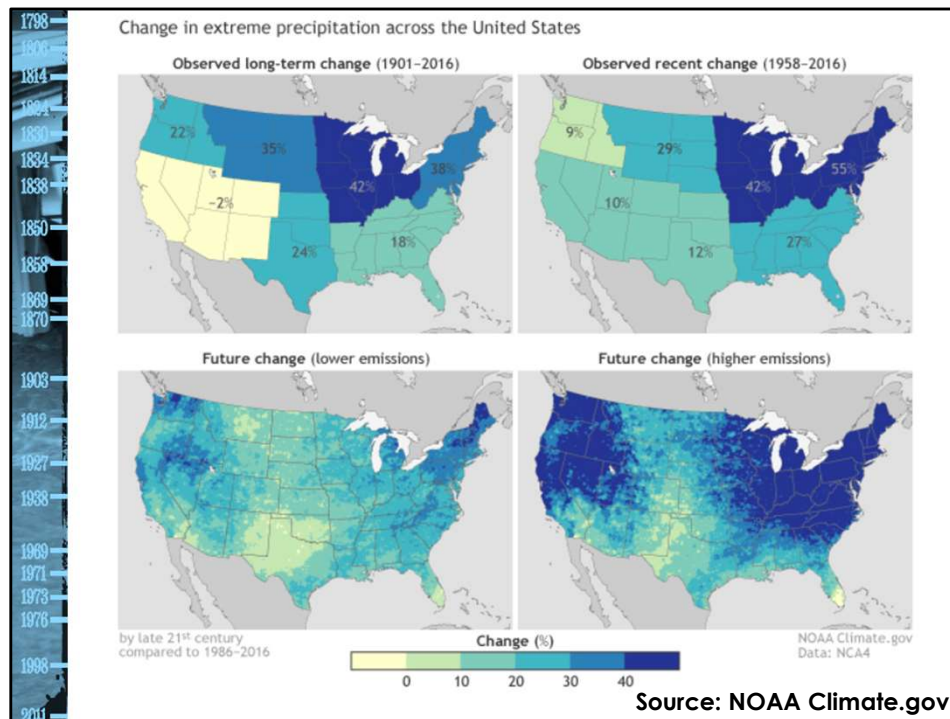
I am Rebecca Pfeiffer, Vermont National Flood Insurance Program (NFIP) Coordinator. I manage our team of Regional Floodplain Managers that make up our River Corridor & Floodplain Protection Program.

Today I am going to speak about our program and how we work with Communities and partners across the state to help protect floodplain functions, which also serves to help promote flood and climate resilience in Vermont.



For more information on specific terms around regulatory floodplains, please visit our [Flood Ready website](#). I'd encourage anyone looking for a basic primer on some of the terms to visit our Flood Training website, where we include resources on [various flood hazard terms](#), and an ~5min. video titled [Making Room For Rivers](#). We created this video to provide a visual introduction to some basic terms and concepts around rivers and floodplains. It also presents information on floodplain management, river corridor protections and municipal strategies to enhance public safety, reduce river conflicts, and protect natural system functions. This is the basis for the No Adverse Impact (NAI) concept that we promote in our existing rules and procedures, and promote with Vermont communities.

FLOODPLAIN MANAGEMENT PRINCIPLES



Something that I don't think I have to convince many people on today of is the impacts that climate change is having here in Vermont. When we look back at the past 120 years, we see that over that time, Vermont and the Northeast and Midwest are areas in the country that have seen an increase in precipitation over time. One big flood event is not climate change – we've had them throughout that time period. However, people are seeing and understanding that while one storm is not "climate change", the increased frequency of such large, intense storm events is the sign of what is not just coming in the future, but what is here now.

From NOAA's climate.gov site, we see that paired with modeling for future predicted changes in precipitation, and you can really see the Northeastern US is expected to *continue* to see greater amounts of precipitation. So... that means more precipitation falling overall throughout the year, and observations of greater precipitation falling in events.

INUNDATION VS. EROSION FLOODING



To set the stage, I wanted to provide some quick background on rivers and flooding in Vermont. Vermont experiences the inundation flooding that you see here on the left, and as we in many parts of Vermont in 2023 and 2024. Here, the river bottom valley floodplain where the river is more flat (and where we may have more of our villages and towns built upon that flat land), the floodplain area fills up with water and debris. This is where the flood water may be deep, and when our towns and cities are built in these inundation floodplains, we see more damages from deep water in homes and businesses. However, more of our flood damages tend to be from flash flooding where the river channel MOVES through it's floodplain and riverbanks, and roads and bridges may move/be undermined during a flood event. This is due to our steep mountains where water, sediment (like the rocks and gravel you see in this other picture), and debris (like trees, washed out culverts, etc.) are washed downhill QUICKLY. The water never has time to fill up the floodplain because it's moving downhill, with all of the stuff it's carrying with it, too quickly to spread out on the floodplain. This results in the river channel moving and adjusting during a flood event and road washouts occur, the river moves within the river valley, or parts of buildings are carried away during the flood.



Vermont
Public

VERMONT FLOOD DAMAGE

July 30, 2024

While we don't have time to watch some of the drone footage captured in the 2023 and 2024 flood events around the state, I would encourage you to find some online. In it, you'll start to see the differences between areas that are subject more to inundation flooding or to more erosion/flash flooding.

FLOODPLAINS...

...dissipate
water energy
& reduce
flashiness...

...and become
the river
channel during
flooding



However, floodplain areas are critical for maintaining stable river channel, storing floodwater and sediment, and helping to convey (move) floodwater across the floodplain during times of flooding. We need our rivers able to access floodplains for a whole variety of reasons, such as slowing and storing floodwaters, allowing sediment to deposit on floodplains rather than in Lake Champlain, the Connecticut River or other impaired waters, and to allow debris to deposit on floodplains, rather than to block up road infrastructure. Where we have open and accessible floodplains, our goal is to help maintain those open areas to avoid future damages, help improve water quality, and help to keep flooding from getting worse.



But when our towns and villages are built in floodplain areas, they have and will continue to experience flooding, and the cost and trauma of flooding will continue. This is exacerbated by the increasing frequency and flood heights that we anticipate due to climate change. So how do we protect homes and buildings in our downtowns while working to protect the floodplains that are still connected and functioning during flooding?

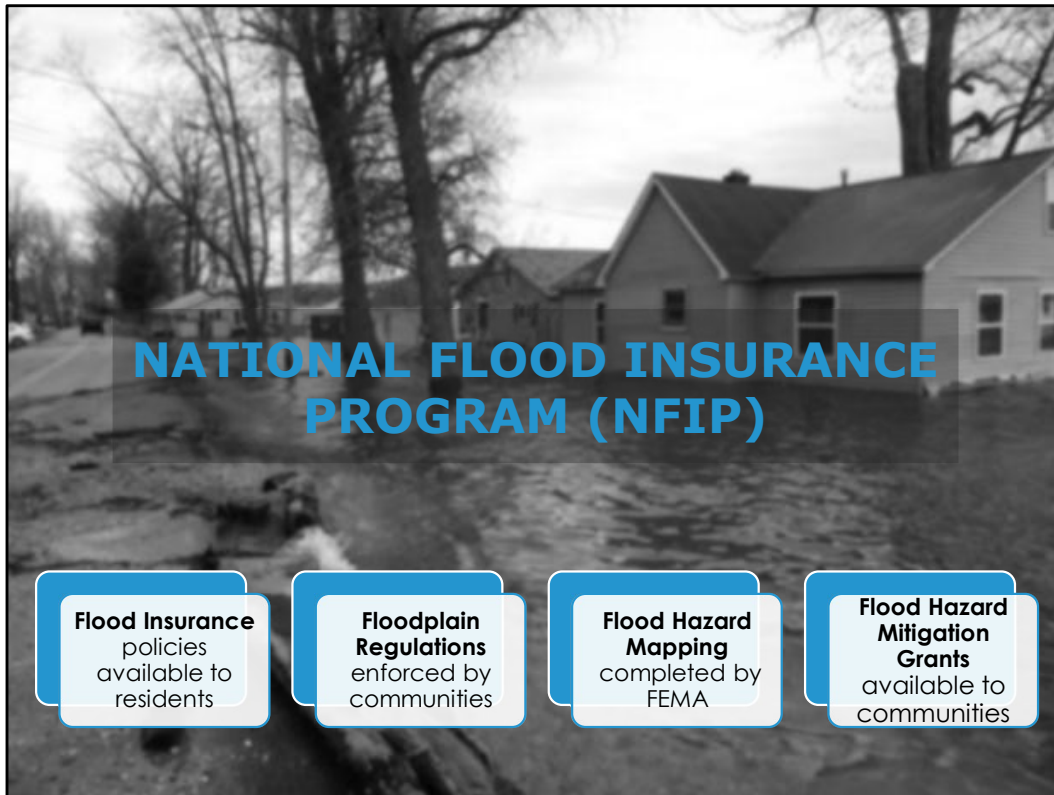


FEMA



NATIONAL FLOOD
INSURANCE PROGRAM®

NATIONAL FRAMEWORK FOR FLOODPLAIN MANAGEMENT



In Vermont, and throughout the US, the main lens that we have looked through for floodplain management has been through the National Flood Insurance Program (NFIP). This is a Federal insurance program that was created in 1968 as a response to the void left when the private sector left the flood insurance market. The NFIP is a voluntary program that is made up of 4 different parts – Communities agree to regulate development to at least a minimum standard set by FEMA. FEMA, in turn, agrees to provide flood insurance to any resident/business in the community. FEMA maps inundation flood hazards to identify where people are *required* to purchase flood insurance if their building is secured with a federal loan or mortgage. For communities that participate, FEMA makes mitigation grants available to reduce overall risk. However, the program is an *INSURANCE* program, and standards are developed to indicate how to construct a building that the NFIP is willing to insure. It is not a comprehensive flood risk reduction program, nor does it consider the protection of floodplains and rivers, and does not address other types of flooding, such as riverine erosion or flash flooding.

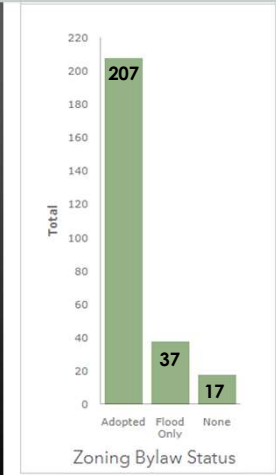
Communities must **adopt, implement & enforce** flood hazard area regulations

Protection of public safety

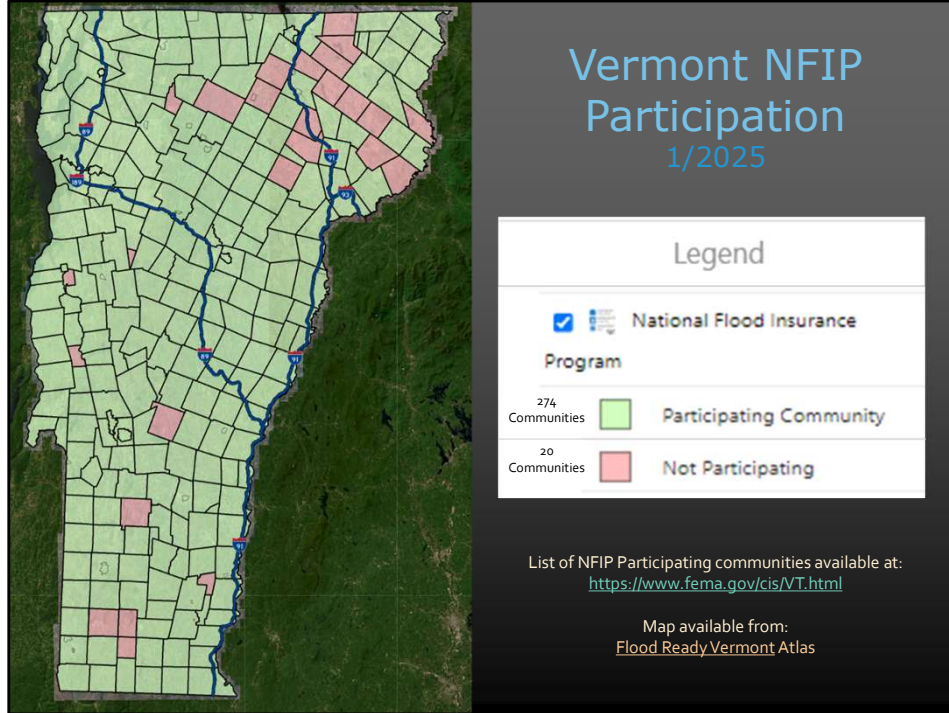
Reduce future flood damages & suffering



VAPDA Fiscal Year 2024 Annual Reports



When communities join the NFIP, they voluntarily agree to adopt flood hazard regulations, as well as to implement and ENFORCE these regulations. While towns that *do* have conventional zoning & subdivision regulations may be challenged to implement and enforce such a technical program, there are many Vermont communities that do not have zoning at all except for flood hazard area regulations. In towns with no zoning, of which there are many in Vermont, local administration of flood hazard regulations is an enormous challenge and, for towns that do not participate, is often the primary barrier to participation in the NFIP.



As of today, we have 274 communities that participate in the NFIP, including towns, cities and incorporated villages (the inclusion of incorporated villages causes the discrepancy in community count with VAPDA's count shown on the previous slide). Only 20 communities do not currently participate in the NFIP and are primarily located in the NEK or border the GMNF. While our Program currently regulates some SFHA development across the state, this is a very limited list of activities that are regulated. For participating communities, they are tasked with regulating all development (human change to real estate, including filling, grading, paving, storage, buildings, etc.) that is located in the SFHA.

Flood Ready

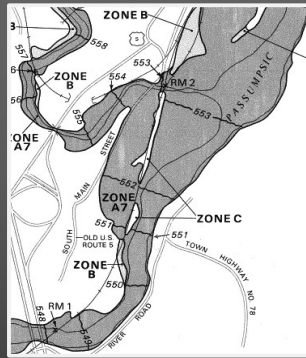
STATE OF VERMONT: FLOODPLAIN MANAGEMENT PROGRAM ROLE

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)

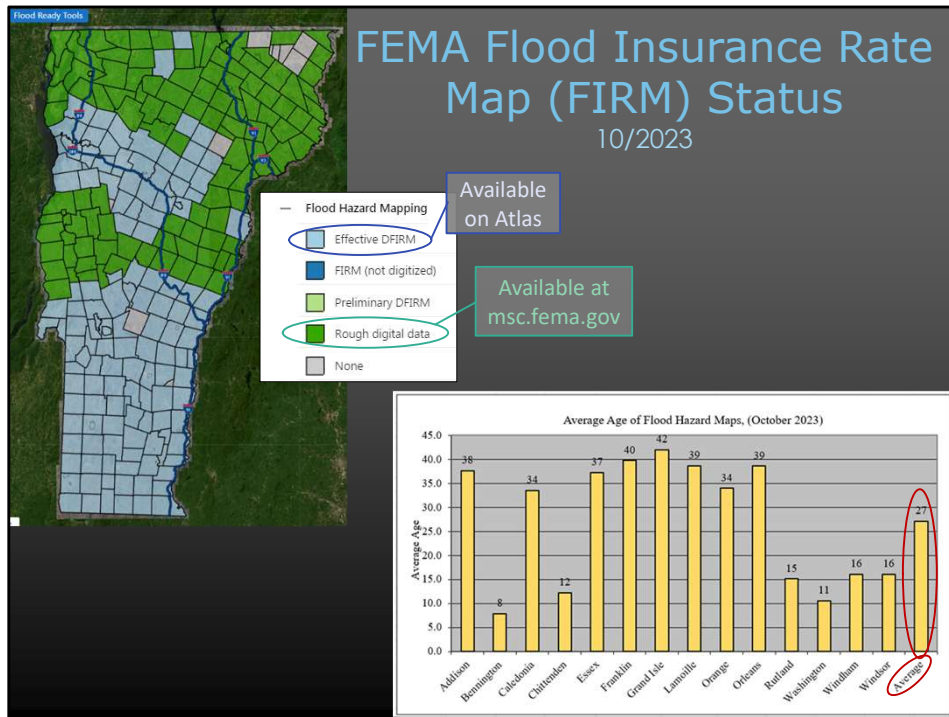
Find your Vermont ANR Regional Floodplain Manager: 

Come to discuss opportunities to take

At present, our State Floodplain Management Program plays many different roles in floodplain management. Part of our program is funded by a FEMA grant to provide technical assistance and support to communities in meeting their NFIP obligations, as well as help to ensure compliance. One of the primary ways we achieve this is by supporting towns in their local review of floodplain development proposals to ensure they meet their local flood hazard standards. We provide comments and technical assistance to towns before they issue their local flood hazard permit. However, the flood hazard permit is issued by the town. We also support communities through training, education & outreach, supporting the local municipal regulatory process (often in partnership with the RPCs), and providing post-flood permitting and damage assessment support. Since our program was initially established in the 1970s to provide this support, our role and mission has grown to also provide flood hazard area determinations under Act 250, along with review of projects under our FHARC procedure. In 2013, the legislature also established our Flood Hazard Area & River Corridor (FHARC) Rule, which went into effect in 2015. Under the FHARC Rule, our program issues permits for development activities that are exempt from municipal regulation and are located in FEMA flood hazard areas or ANR-mapped River Corridors.



NFIP FLOOD HAZARD MAPS



Around ½ of the state of Vermont still has paper flood hazard maps as their official, effective FEMA map. This means that we do not have digital flood maps for communities to review and regulate floodplain development. Additionally, you can see that the average age of flood maps in VT is almost 30 years old. Even in counties with relatively new flood maps, many of the flood studies were not updated and simply converted to a digital format.

**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 as 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>

Projected Prep Deadlines by County

VTDEC 1/2025

However, new FEMA maps are currently being developed and are anticipated to roll out across the state in the coming years.

As new maps are prepared for adoption and update at the local level, the towns are required to ensure that their local flood hazard regulations are at least minimally compliant with FEMA’s minimum standards. This presents us with a rare opportunity with the adoption of a minimum state flood hazard area standard. We’re working with the RPCs to engage with communities across the state on this mapping and bylaw update effort but are challenged by the sheer numbers of municipal flood hazard regulations that would need review and update. Standardizing municipal flood hazard regulations would also help ensure that all of our NFIP participating communities would be in compliance with FEMA’s minimum NFIP requirements.

MOVING BEYOND THE NFIP:
VERMONT'S NO ADVERSE IMPACT (NAI)
FLOODPLAIN PRINCIPLES

NO ADVERSE IMPACT (NAI) STANDARDS: RIVER CORRIDOR



- BUILD NO CLOSER TO THE RIVER WHERE DEVELOPMENT EXISTS
- PRESERVE SPACE STILL AVAILABLE



In River Corridors, we've promoted a standard to avoid new encroachments in undeveloped RC areas and ensuring existing development doesn't extend any closer to the river. New development is subject to *both* of these regulatory layers.

NAI STANDARD: FLOODPLAINS

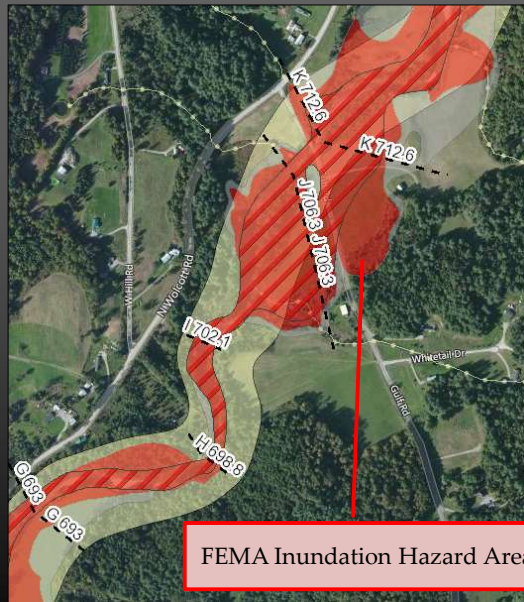
FEMA Floodways

NO INCREASE IN BASE FLOOD
ELEVATION (0.00) OR *VELOCITY*

Entire Flood Hazard Area

- NO LOSS OF FLOOD STORAGE VOLUME (<0.1' RISE) OR INCREASE IN VELOCITY
- STRUCTURES ELEVATED 2' ABOVE BFE
- CRITICAL FACILITIES ELEVATED TO THE 0.2% ANNUAL CHANCE FLOOD ELEVATION

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



In the SFHA, this approach includes a standard of no loss of flood storage volume or increase in velocities in the entire SFHA, a minimum of 2' of freeboard and elevation of critical facilities above the 0.2% AEP.

STATE FLOOD HAZARD AREA & RIVER CORRIDOR (FHARC) RULE



PUBLIC POWER
GENERATION &
TRANSMISSION (PUC)



ACCEPTED
AGRICULTURAL &
SILVICULTURAL
PRACTICES



STATE-OWNED AND
OPERATED BUILDINGS
AND FACILITIES

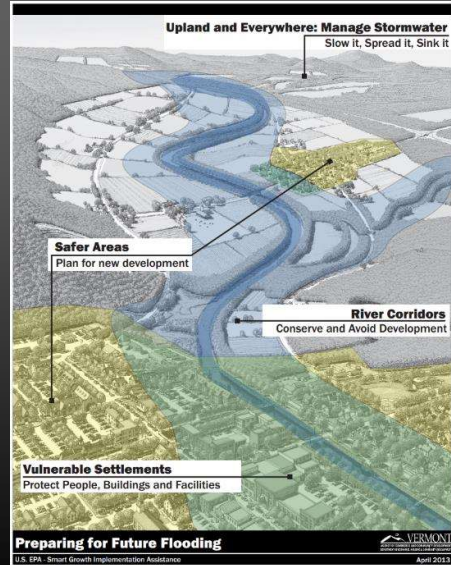
The NAI principals are the focus of our limited state FHARC Rule...

FLOOD RESILIENT COMMUNITY PLANNING

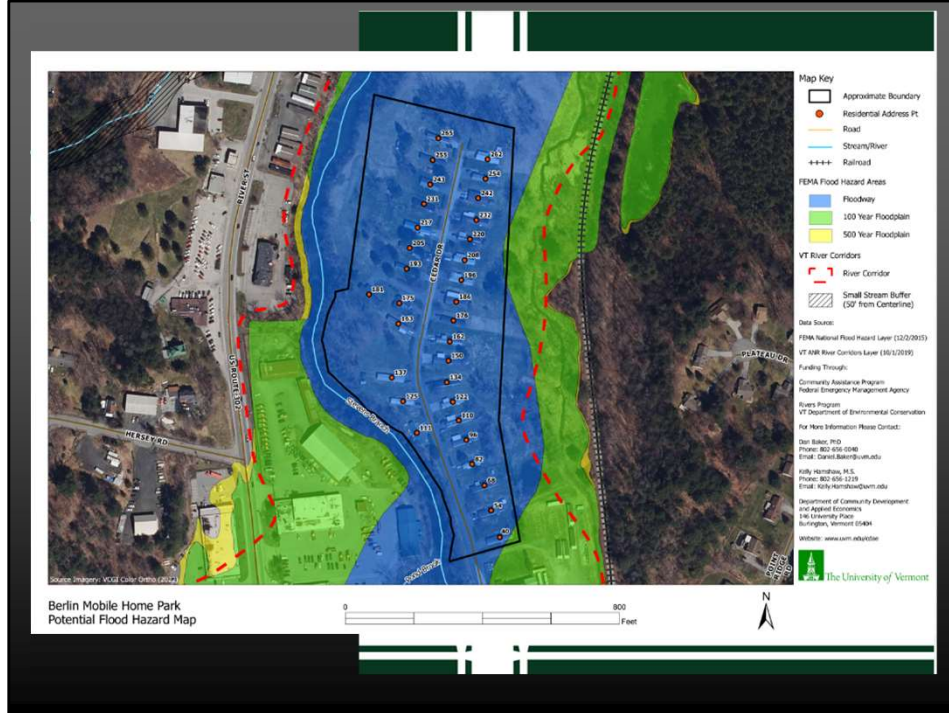
A Resilient Landscape has space for dynamic natural processes

A Resilient Community can learn and adapt

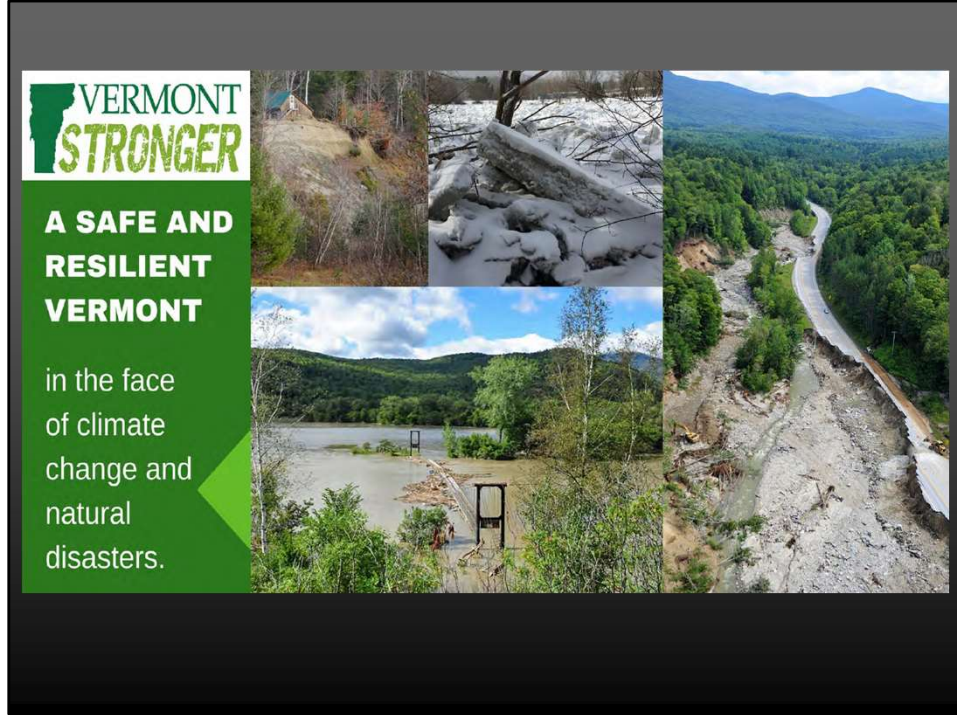
The Flood Resilience Checklist for Vermont Communities at:
https://floodready.vermont.gov/update_plans



And the focus of the flood resilient community planning that we partner with others to promote in towns. The question may often come up pitting floodplain and river corridor protections against the very real need for housing in Vermont. These two objectives do not need to conflict with each other. The need for new housing is real, but I don't think that we should be putting new and meaningful investments in housing in known hazard areas. The costs are too high – the trauma of living through a flood is real. We can look to better protect the downtowns we have, avoid development in known hazard areas, and plan for safe areas for compact villages and growth areas.



We've also working with partners at UVM and CVOEO to promoting NAI-focused planning in Manufactured Home Communities. We were able to contract with a team from the University of Vermont to study, document and assess inundation and erosion flood risk in MHCs around the entire state. The study was finalized June 15 of 2023 – less than a month before the July 2023 floods occurred. We now post maps for all MHCs that have land and lots located in a flood hazard area or river corridor on our Flood Ready website. We're currently continuing to fund this work to promote flood resilience planning in several MHCs in the Lake Champlain Basin.



As impacts from climate change are felt around the country, every state and region will need to develop its own approach to addressing the flood risk that is specific to their region. We're working to continue to support and promote discussions with communities about their own flood risk and work to support a more comprehensive state approach to flood hazard management.

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State Floodplain Manager
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▶ MORE INFORMATION

FLOOD READY VERMONT
Mitigation Actions for Communities



<http://Floodready.Vermont.gov>

Flood Training:
Basic Concepts & Planning



<https://floodtraining.vermont.gov/>

VTDEC
Floodplain Management:



<https://dec.vermont.gov/watershed/rivers/river-corridor-and-floodplain-protection/floodplains>

And with that, I want to thank you all.