

2023 Vermont State Hazard Mitigation Plan

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VERMONT STRONGER



**A SAFE AND
RESILIENT
VERMONT**

in the face
of climate
change and
natural
disasters.



State & Local Hazard Mitigation Plans:

- Hazard mitigation planning identifies a path towards resilience.
- State and local governments are required by FEMA to have a hazard mitigation plan to access funding.
- The State Hazard Mitigation Plan (SHMP) serves as a resource to inform Local Hazard Mitigation Plans (LHMPs).



The Plan:

- Section 1: Executive Summary
- Section 2: Planning Process
- Section 3: State & Local Capabilities
- Section 4: Vermont Profile & Hazard Assessment
- Section 5: Vulnerability Summary
- Section 6: Mitigation Strategy
- Section 7: Maintenance and Implementation



Process Timeline:

Launching the Process

Summer 2022

Understanding the Challenges

Fall 2022 - Spring 2023

Finding Solutions

Spring 2023 - Summer 2023

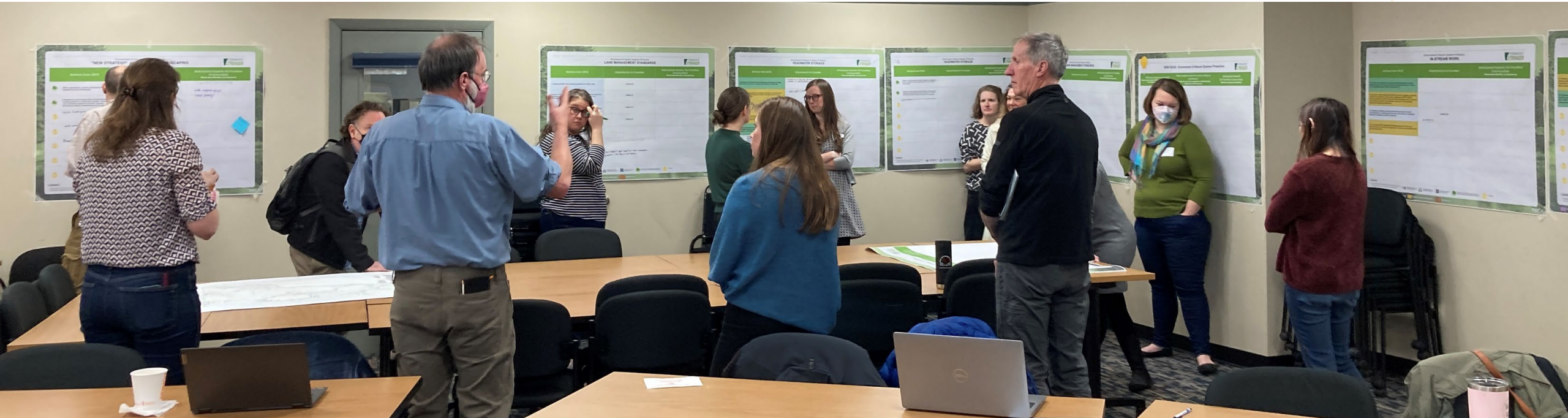
Creating a Plan

Spring 2023 - Summer 2023

Moving Forward

*Implementation Beginning
Fall 2023*

Figure 4: 2023 Vermont State Hazard Mitigation Plan process timeline



Capabilities Assessment:

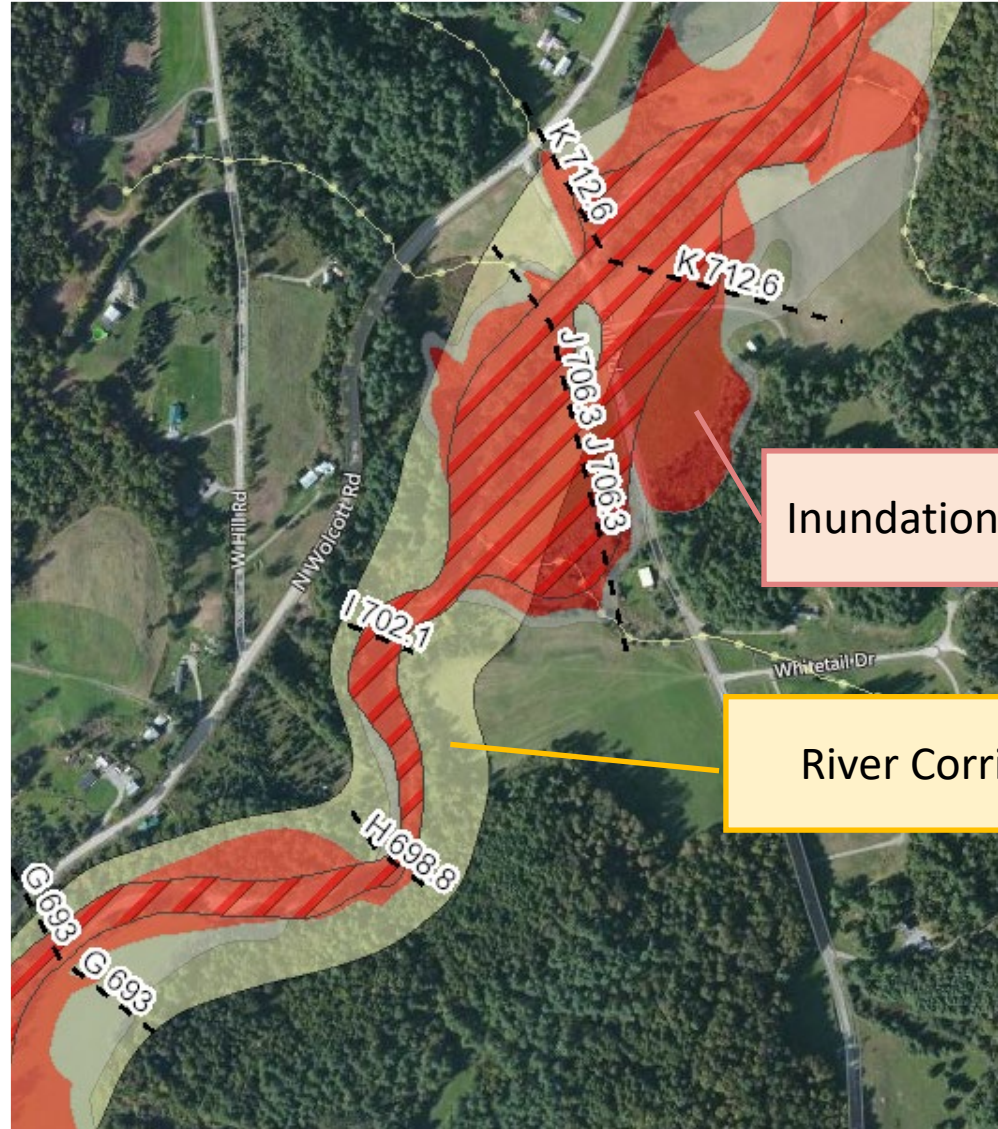
FUNDING

TOOLS & DATA

TECHNICAL ASSISTANCE

REGULATIONS

IMPLEMENTATION



Inundation Hazard Area

River Corridor

Natural Hazards:



Hazard Impacts:

Table 13: Hazard Assessment Ranking Criteria

	Frequency of Occurrence: Probability of a plausibly significant event impacting the community or regional scale based on previous occurrences and climate change projections.	Potential Impact: Severity and extent of damage and disruption to built and natural environments, people, and the economy
1	Unlikely: <1% probability of occurrence per year	Negligible: isolated occurrences of minor built or natural environmental damage, potential for minor injuries, health, or well-being impacts, or minimal economic disruption.
2	Occasionally: 1–10% probability of occurrence per year, or at least one chance in next 100 years	Minor: isolated occurrences of moderate to severe built or natural environmental damage, potential for injuries or health or well-being impacts, minor economic disruption.
3	Likely: >10% but <75% probability per year, at least 1 chance in next 10 years	Moderate: severe built or natural environmental damage on a community scale, injuries, fatalities or impacts to individual and community well-being, short-term economic impact.
4	Highly Likely: >75% probability in a year	Major: severe built or natural environmental damage on a community or regional scale, multiple injuries or fatalities or severe long-term impacts to individual and community well-being, significant long-term economic impact.

Table 12: 2023 Hazard Assessment

Hazard Impacts	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	<u>Average:</u>	
Fluvial Erosion	4	4	4	4	4	4	16
Inundation Flooding	4	4	4	4	2	3.5	14
Heat	4	2	4	3	2	2.75	11
Wind	4	3	2	2	2	2.25	9
Snow	4	2	3	2	1	2	8
Ice	3	2	3	3	2	2.5	7.5
Drought	3	1	3	3	3	2.5	7.5
Infectious Disease Outbreak	3	1	4	4	1	2.5	7.5
Cold	3	2	3	2	2	2.25	6.75
Invasive Species	3	2	1	3	3	2.25	6.75
Landslides	3	3	2	1	2	2	6
Wildfire	2	3	3	3	3	3	6
Earthquake	2	2	2	2	2	2	4
Hail	3	1	1	2	1	1.25	3.75

*Score = Probability x Average Potential Impact

State & Local Vulnerability:

- Vulnerability of an asset is determined by exposure to a hazard.
- Some people may be disproportionately affected by a hazard.
- We identify vulnerabilities in four categories:
 - Built Environment
 - People
 - Natural Environment
 - Economy



Mitigation Strategy – Goals:

ENVIRONMENT & NATURAL SYSTEMS:

Protect, restore and enhance Vermont's natural resources to promote healthy, resilient ecosystems.

BUILT ENVIRONMENT:

Enhance the resilience of our built environment - our towns, infrastructure, buildings, and cultural assets.

PLANS & POLICIES:

Develop and implement plans and policies that create resilient natural systems and built environments.

EDUCATION & OUTREACH:

Create a common understanding of – and coordinated approach to – mitigation planning and action.

Mitigation Strategy – Strategy & Actions:

Goal	Strategy	Action Number	Actions	Source	Hazard(s) Addressed	Lead	Partners	Feasibility	Impact (Positive)	Impact (Negative)	
Establish a statewide conservation and buyout program		20	Complete a review of nationwide building codes (to include residential and energy codes) to determine what codes could be best suited to Vermont, including standards for new construction and best practices for existing buildings (e.g., weatherization, retrofit - tied into manufactured housing) - integration into existing Vermont codes, including impacts to frontline communities (BRIC scoping application).	2018 SHMP (Action 26) /2023 SHMP	All Hazards	Norwich	Norwich, DPS - Fire Safety	Medium	Medium	Low	
		21	Evaluate methods for resilient construction standards of manufactured housing that maintain affordability for low- and moderate-income residents.	2023 SHMP	All Hazards			High	High	Low	
		22	Develop an application under FEMA's Annual Building Resilient Infrastructure and Communities (BRIC) program to evaluate the value of developing a residential building code in Vermont.	2023 SHMP	All Hazards	VEM		High	Medium	Low	
			23	Create a mechanism for monitoring tax-sale/foreclosed properties and other for sale properties located within FEMA and State River Corridor map to identify flood-vulnerable structures (including mobile homes) that are not on the FEMA Repetitive Loss (RL) or Severe Repetitive Loss (SRL) list to be used for buyout/conservation prioritization (BRIC scoping application).	2018 SHMP (Action 53)	Inundation; Fluvial Erosion	VEM	ANR, VEM, VT Realtors, ACCD, VLCT	Medium	High	Medium
			24	Develop a modified BCA process more adequately incorporate social equity considerations specific to Vermont within the BCA tool (BRIC Scoping).	2018 SHMP (Action 54)	Inundation; Fluvial Erosion; Landslide	VEM	VEM, ANR, RPCs, ACCD	Medium	Medium	Low
			25	Create a mechanism for monitoring the relocating or retrofitting at-risk mobile home parks at the time of sale or substantial rehabilitation.	2018 SHMP (Action 55)	Fluvial Erosion	VEM	VT Silver Jackets, VEM, ANR, ACCD	Medium	High	Low
			26	Pilot engagement strategies for buyouts and re-location of manufactured housing communities to develop outreach materials and develop case studies on program coordination and successful resilience improvements.	2023 SHMP	All Hazards	VEM	ACCD, UVM, CVOEO, CAO, EJ CRU	Medium	High	Low
			27	Define process for updating and maintaining the data within the Transportation Resilience Planning Tool (TRPT) as well as explore tool additions i.e., rail infrastructure and enhancements e.g., coordination with Reducing Repeat Damage update efforts (MAP-21 Part 667). (Resource: PROTECT Planning funds, 2% required)	2018 SHMP (Action 41)	Inundation; Fluvial Erosion; Landslide	ACCD	ACCD, CVOEO, UVM	Medium	Medium	Medium
	Incorporate flood resilience in transportation planning, engineering and programming		28	Evaluate transportation programs, standards, policies, etc. for the integration of resilience planning, design, and construction methods; including nature-based solutions and geomorphic compatibility assessments.	2023 SHMP	Inundation; Fluvial Erosion	UVM	CVOEO	High	Medium	Medium
			29	Develop a Resilience Improvement Plan (RIP) and identify funding options for implementation under the PROTECT program and in coordination with other funding.	2023 SHMP	Inundation; Fluvial Erosion	VTrans		High	High	Low
			30	Support municipalities in developing a prioritized list of transportation infrastructure	2023 SHMP	Inundation; Fluvial Erosion	VTrans	DEC - Rivers, Norwich (University Transportation Center)	Medium	Medium	Low
31				2023 SHMP	Inundation; Fluvial Erosion	VTrans	VEM	High	High	Low	

• 112 Total Actions
 • 43 Priority Actions
 • 10 Top Priority Actions

Priority Actions:

ENVIRONMENT & NATURAL SYSTEMS:

- Develop an inventory of critical headwater and floodplain storage areas that would result in a measurable abatement of flooding (DEC Rivers)
- Develop a drought plan for Vermont to use as predictor of drought and rates of recovery (UVM VSCO)
- Develop a wildfire mitigation plan to address long-term future risk of wildfire due to climate change and wildfire mitigation options (FPR)

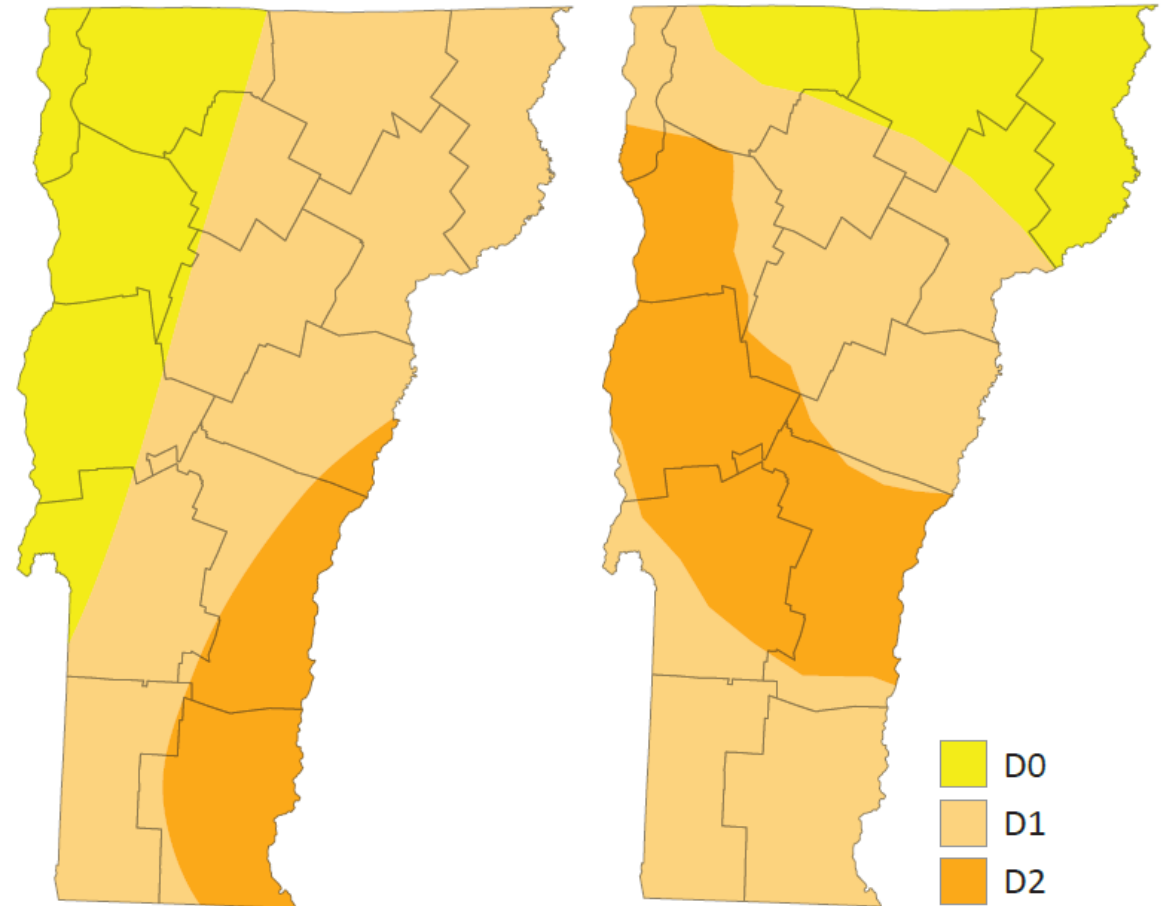


Figure 49: Map of abnormally dry (D0) to severe drought (D2) during significant drought periods in Vermont in late 2001 (left) and late 2016 (right)

Data Source: <https://www.drought.gov/drought/states/vermont>

Priority Actions:

BUILT ENVIRONMENT:

- Support municipalities in developing transportation infrastructure improvements that increase resilience using PROTECT and/or other funding sources (VTrans)
- Increase Public Service Department capacity to maximize utilization of available federal dollars (including IIJA, IRA, ARPA, and EDA) towards utility resilience implementation work (PSD)



Credit: TRORC, Bridgewater, 2011 (Topical Storm Irene)

Priority Actions:

PLANS & POLICIES:

- Assess all State funding, technical assistance and permitting programs to determine areas for better alignment around hazard mitigation priorities
- Identify sustainable, long-term funding to support local match and hazard mitigation activities that are not eligible for FEMA funding (VEM)
- Complete an assessment of heat risks in urban areas of Vermont and expected impacts on historically disadvantaged populations, identify strategies for mitigating impacts (VDH)

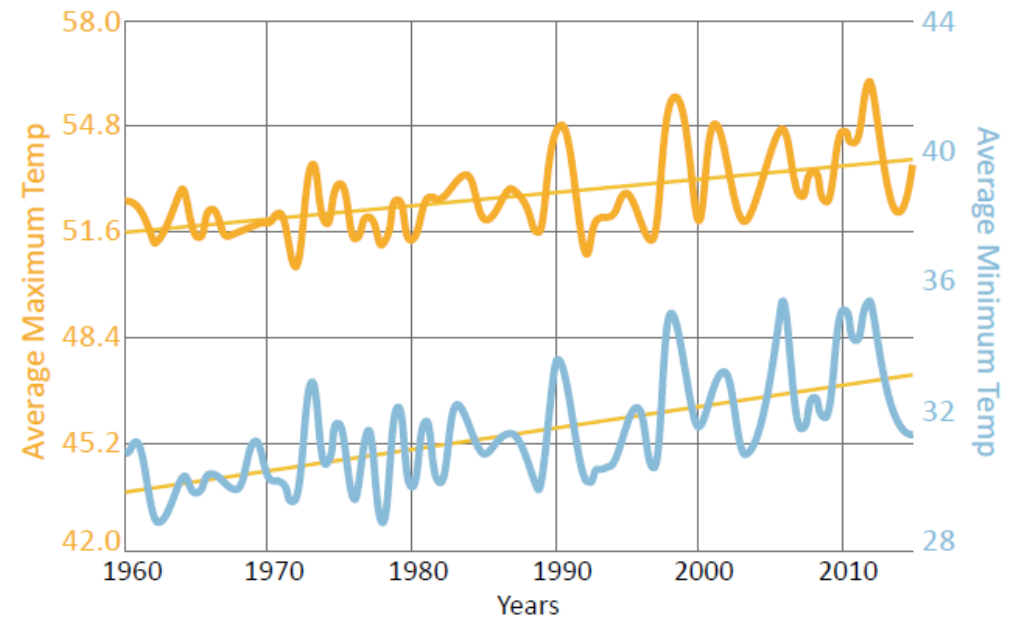


Figure 37: Vermont's average annual maximum & minimum temperatures (1960-2015)
Source: climatechange.vermont.gov

Priority Actions:

EDUCATION & OUTREACH:

- Develop a methodology and protocol for quantifying climate mitigation, resilience, and adaptation impacts (CAO)
- Develop an analysis of existing Resilience Hub locations and identification of key components that should be co-located within a Resilience Hub.



Contact:

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vem.vermont.gov/plans/SHMP



CAP

- Actions to build resilience to prepare the State's communities, infrastructure, economy, and working lands to adapt to the current and anticipated effects of climate change.
- Focuses on the pressures that climate change adaptation will impose on rural transportation, electricity, housing emergency services, and communications infrastructure, and the difficulty of rural communities in meeting the needs of its citizens.
- Cross-cutting actions that lay the foundation for the state to better adapt to and mitigate the effects of climate change, while also seeking economic opportunities.

Overlap

- All hazards plans.
- Multi-stakeholder plans.
- Narrative on the impact of climate change on natural hazards.
- Narrative on the cascading impacts of climate change.
- Include actions on aligning state programs and policies, increasing local and regional capacity to improve resilience, and expanding education and outreach capacity for climate adaptation.

SHMP

- Identifies natural hazards that affect Vermont, assesses risk and vulnerability to these hazards, and identifies top priority mitigation actions at the State level to remove vulnerability and create a more resilient Vermont.
- Acts as a resource for Local Hazard Mitigation Plan development.
- Includes a hazard and vulnerability assessment.
- Includes actions to mitigate the effect of natural hazards on natural resources, the built environment, and communities.
- Required so the state can access Hazard Mitigation Assistance grant opportunities.

SHMP and CAP progression



2018 Vermont State Hazard Mitigation Plan



2023 Vermont State Hazard Mitigation Plan

Select actions included in CAP Pathways for Adaptation and Building Resilience in Communities and the Built Environment

Select actions included across SHMP with some revisions to reflect work and progress to-date



INITIAL VERMONT CLIMATE
ACTION PLAN

2021



**2025
Climate
Action Plan**

Resilience Implementation Strategy

Strategy will:

- Inventory existing efforts
- Identify gaps
- Prioritize needs
- Form funding strategy

Near Term Priority:

- Establish a baseline understanding of the risks that climate change poses to Vermont's environment, communities, infrastructure, and economy and the programmatic work State Government is currently engaged in to address those risks and identify gaps. ***Timeframe: Fall 2024***

Long Term Priority:

- Understand the costs associated with interventions needed to fill gaps based on priorities; identify mechanisms to fill gaps. ***Timeframe: by July 1, 2025***