

# Planning for Climate Resilience at the Local Level



**VECAN CONFERENCE 2014**  
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**Ellis**  
**Agency of Natural Resources**



# Our Agenda

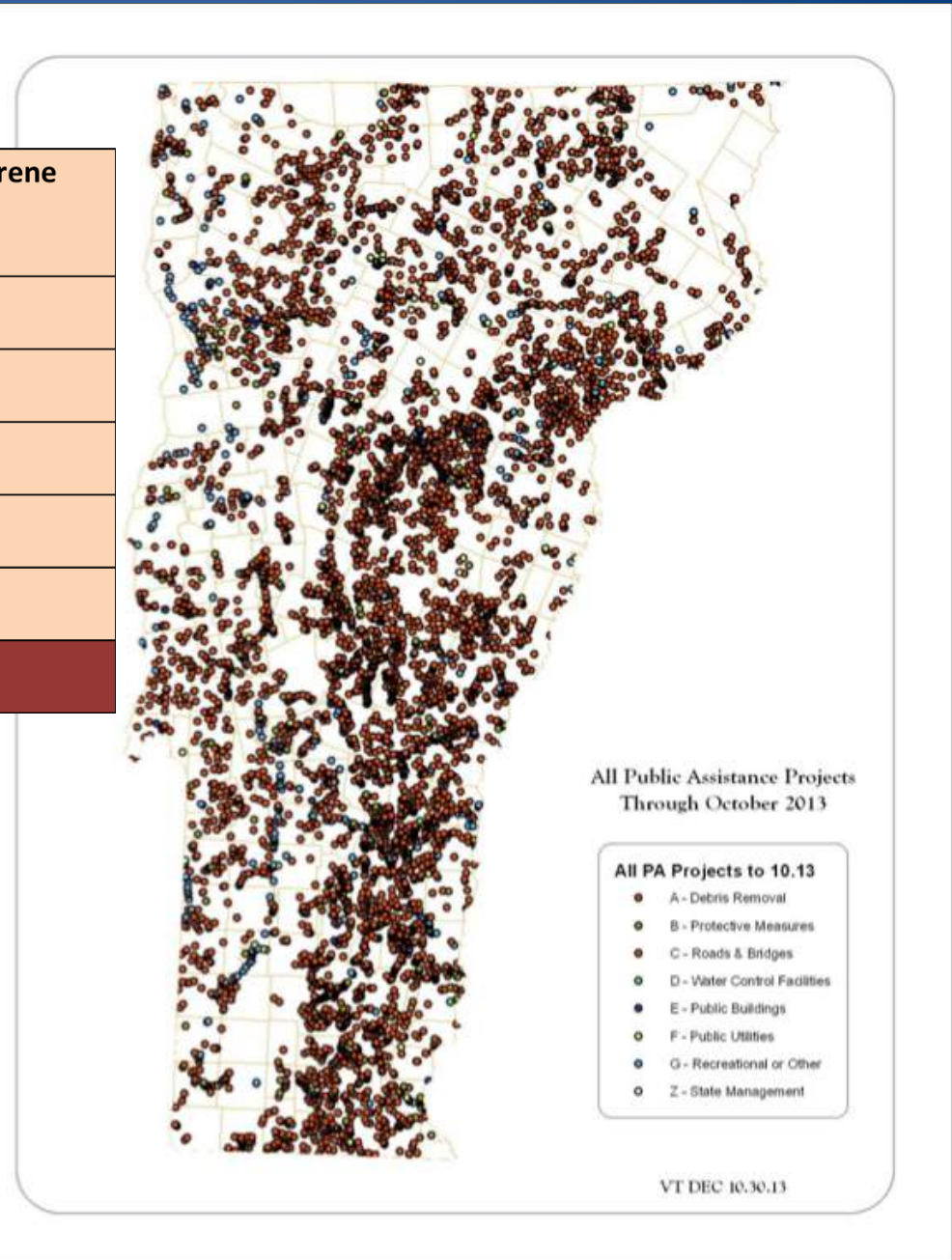
1. Resilient to What?
  - How is Climate Change Likely to Effect Vermont?
  - How is State Government Working on Resilience?
2. DISCUSSION: What would resilience look like in your community?
3. Planning Ahead: Building Resilience Through Hazard Mitigation Planning
4. The Town of Waterbury: A Case Study in Local Flood Resilience Projects
5. Small Group Discussion at Your Table: How could your town energy committee help improve resilience?

## TOTAL IRENE COSTS:

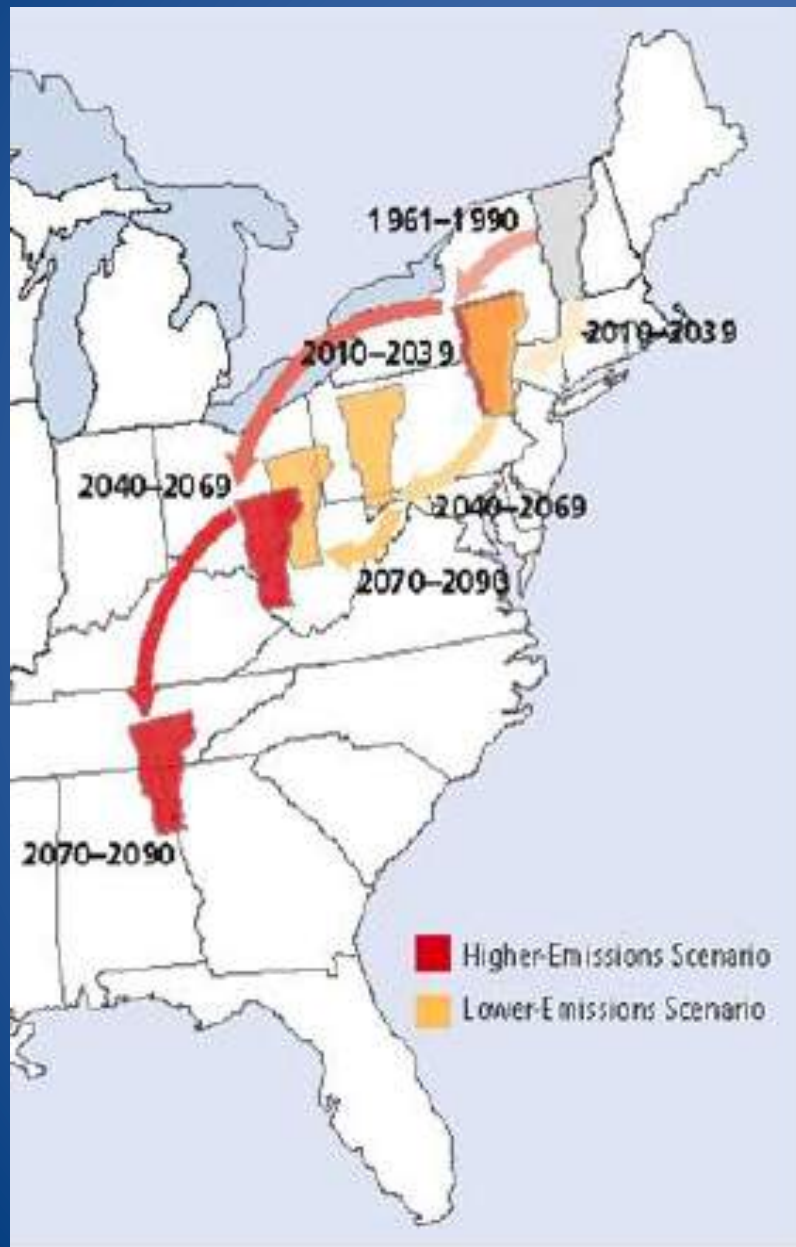
Source of Funding	Estimated Expenditures in Final Irene Recovery Report (In Millions)
Federal	\$603
State	\$145
Local	\$9
Private	\$31
Insurance Claims	\$63
<b>TOTAL</b>	<b>\$850</b>

Irene's resulted in a federally declared disaster in *every* VT county and produced devastating impacts

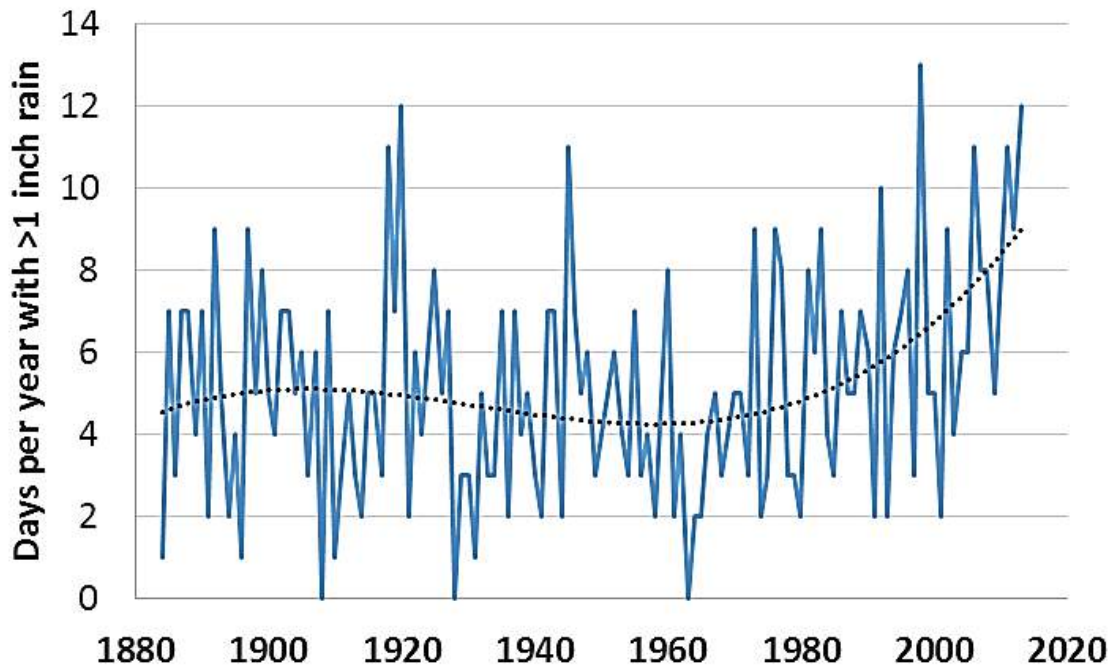
But public and private spending on flood recovery is nothing new in this state



# What Risks Will Climate Change Bring?



- Avg annual temperature up by 1.3° F since 1960
- Temperatures projected to rise by another 2-3.6° F by 2050 and 5-5.4° F by 2100
- Many changes in length, timing of seasons



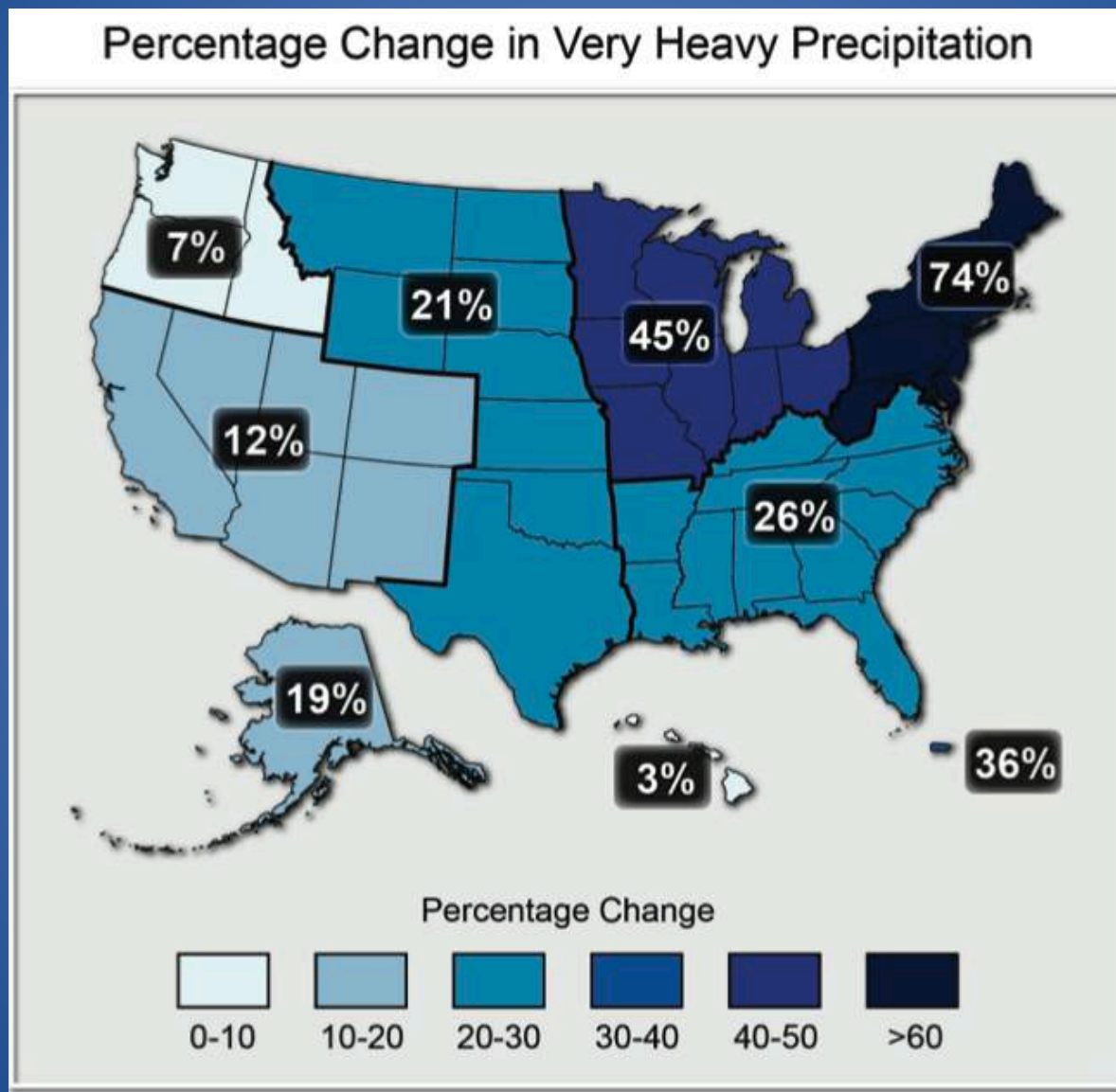
*Number of days per year with greater than 1" of precipitation BTV station).*

**Average annual precipitation** across the state has increased by 6 inches since 1960

Almost 50% of this increase occurred since 1990

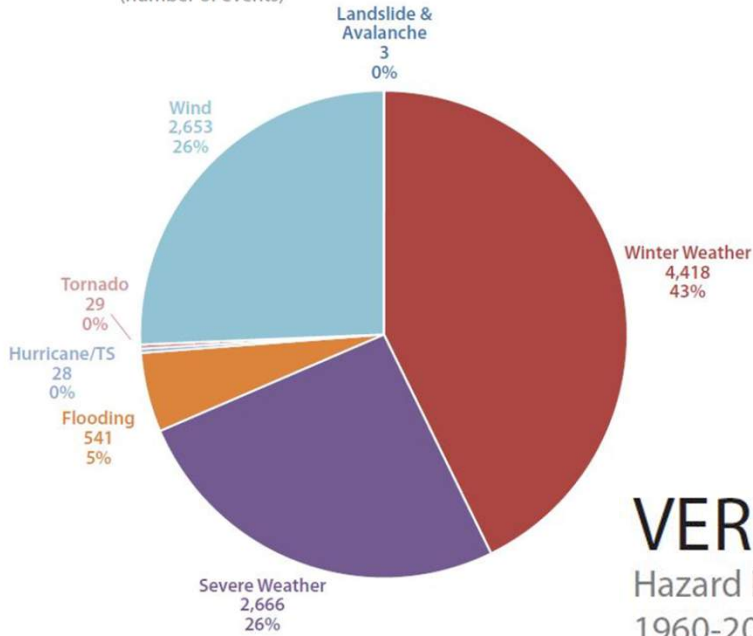
Significant increases in stream flows (20-30% over 70 years in some places)

# Biggest Concern: Intensity and Persistence



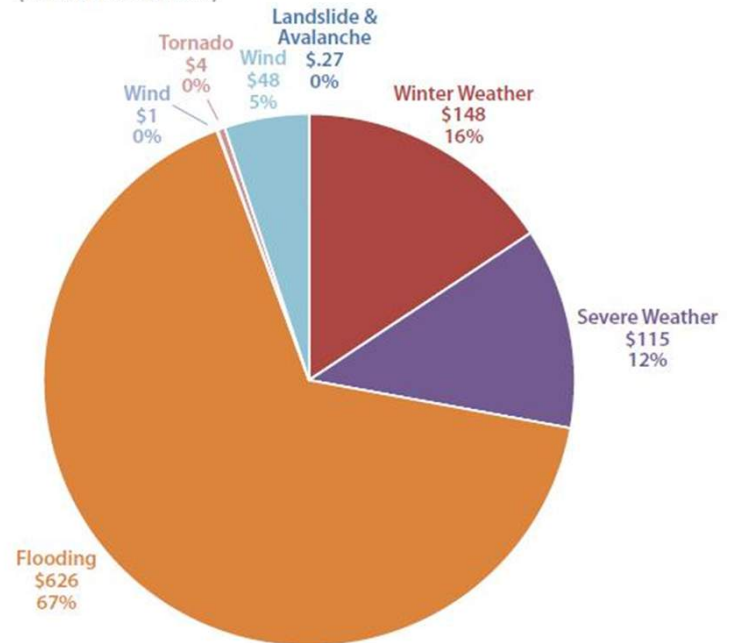
# Disruption from frequent severe winter storms can be enormous

Distribution of Hazard Events  
(number of events)



## VERMONT Hazard Losses 1960-2009

Distribution of Losses by Hazard Type  
(in 2009 USD million)



From The Special Hazards  
Event and Losses Database  
(SHELDUS)

# Risks for Energy Systems

- Flood risks to physical infrastructure
- Power outages, especially for critical systems – e.g. water, wastewater
- Contamination
- Disruption to supply of fossil fuels from coast
- Increased energy use (more air conditioning in summer will outweigh reduced energy demand for winter heating)





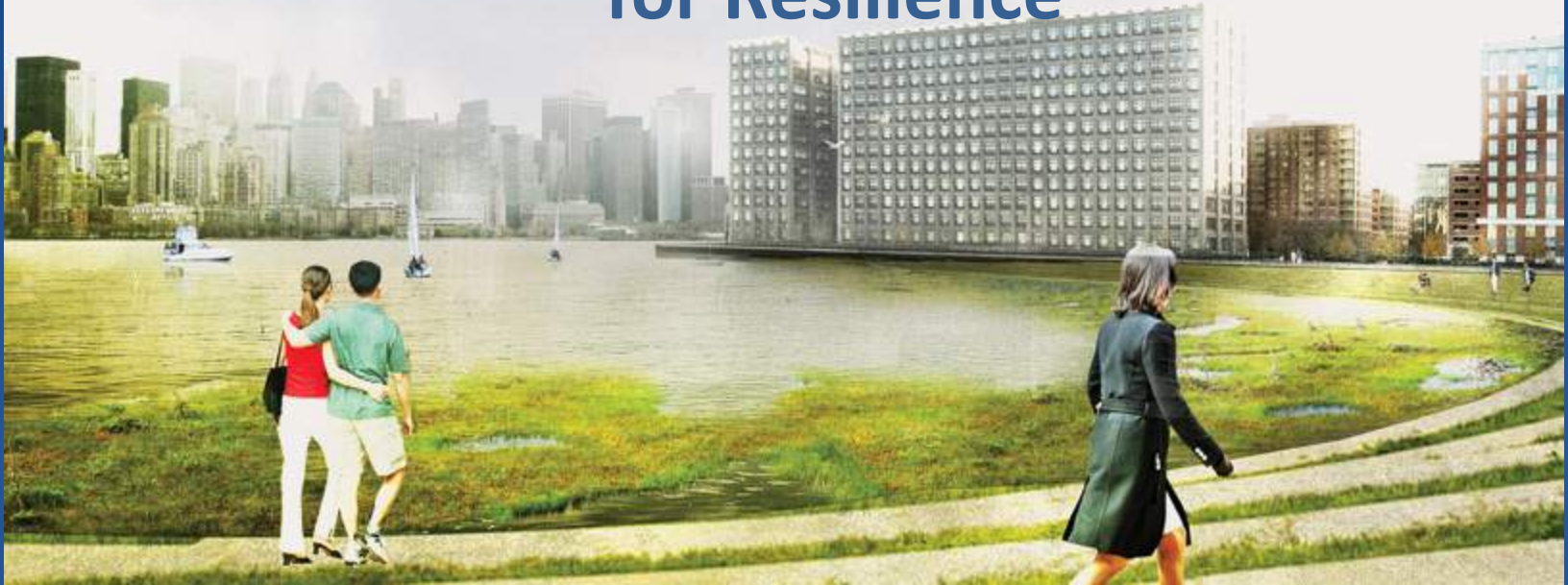
# Vermont's Climate Resilience Initiatives



Vermont and 25 other jurisdictions delivered 100 plus recommendations to the President in November

EXAMPLE: Align funding programs so we build and rebuild with resilience, fund adaptation that also benefits mitigation

# New Federal Funding Sources for Resilience



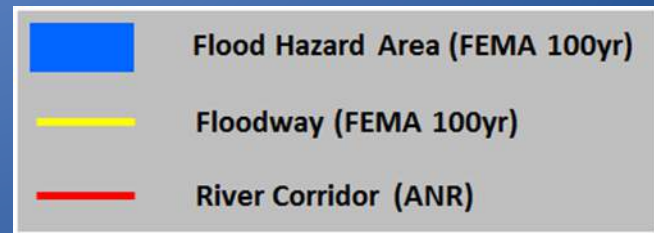
## NATIONAL DISASTER RESILIENCE COMPETITION

- 1 Billion for disaster affected areas (2011-2013)
- Innovative local projects
- Recovery while making plans and adopting policies for future resilience
- Vermont will submit one application

# Brand New, Better Maps of Hazardous Areas



- Statewide GIS “layer” for mapped River Corridors (reaches with watersheds > 2 sq. miles) just released this week



# A New Flood Resilience Web Site

VERMONT

Flood Ready  
State of Vermont

VERMONT.gov  
official state website

Search

Home

Rising Danger - Flood Costs

Community Risk Assessment

Community Reports

Map Tools

Vermont Flood Ready Atlas

Update Your Plans

Use Natural Flood Protection

Improve Infrastructure

Find Funding

Making It Happen

1974

1962

Map tools

1 2 3 4

**Assess Your Community's Risk**

We are all at risk of damage from flooding. Our roads and rail lines cross streams and rivers. Sometimes our critical buildings, such as town halls and fire departments, are in a floodplain. At times, [natural flood protection](#), such as wetlands and forested watersheds, adequately protects our buildings and infrastructure by reducing the volume of water flowing through our communities during storms, but what happens when natural protection isn't sufficient?

NEWS

November 25, 2014  
**River Corridor Base Map Posted**

October 14, 2014  
**Vermont Watershed Grant Application due Nov. 21**

October 7, 2014

David Mears signature.jpg

20141206 Ellis VECA....pptx

VECAN 2014.pptx

SHELDUS pie charts.pptx

- Forum for Peer Learning
- A portal to Hazard Maps
- Community reports
- Success Stories
- Resources

VT TOWN	E911 Structures in SFHA
10	Single Family
3	Commercial
1	Mobile Home
1	Camp
15	Total

# Resources for Resilience Strategies – preparedness and prevention



Compact, low carbon, flood resilient development

Climate resilient infrastructure development and retrofitting

Elevated, properly anchored energy systems'

Back up power

- State Hazard Mitigation Plan and FEMA guides to preparedness
- Comprehensive Energy Plan
- Planning Manual for Vermont Municipalities

**EXTRA SLIDES**

# One Definition of a Resilient Vermont

## A Resilient Vermont:

A resilient Vermont is better for and able to more effectively manage and bounce back from natural disasters and climate-related shocks, and the risks they pose to our economy, environment, and social well-being.

A resilient Vermont focuses on both proactively reducing our vulnerabilities and improving our response and recovery, to ensure that we are continually strengthening our resilience.

We must be resilient at every level – from individual residents, households, and businesses and neighborhoods, to the entire community and state. There is a shared sense of responsibility for resilience at every level and across the public, private, and nonprofit sectors.

