



Town of Provincetown, Planning for a Resilient Future

Community Dialogue Presentation | March 15, 2018

Introduction to Arcadis & Team



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Introduction and Goals

- **Provincetown through the eyes of Climate Resilience**
 - Definition, general resilience, first impressions
- **Risk versus National Flood Insurance Program (NFIP)**
 - The current NFIP situation, insurance implications
- **What can property owners do to reduce risk**
 - Individual risks, damage characteristics, how to mitigate risk
- **Q & A**



Provincetown through the eyes of Climate Resilience



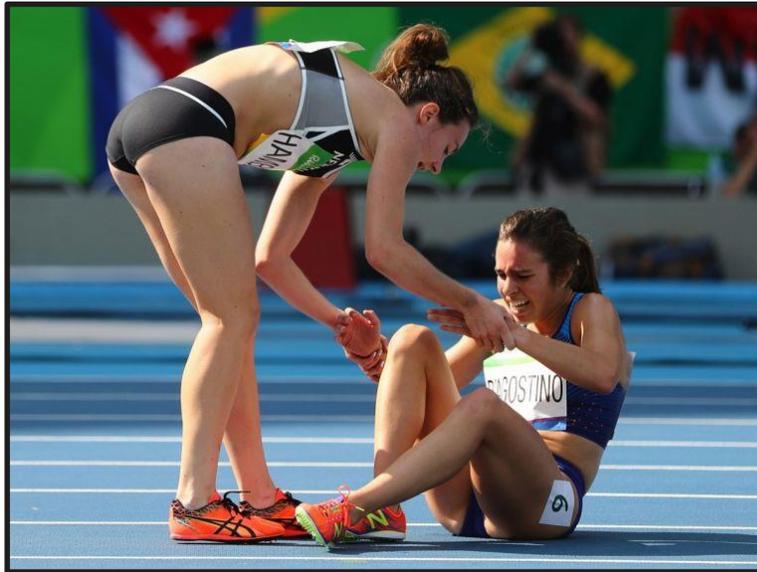
Building Climate Resilience

“Resilience is the capacity of individuals, communities and systems to **survive, adapt,** and grow in the face of stress and shocks, and even **transform** when conditions require it.” (~The Rockefeller Foundation)



Resilience is the ability to achieve your mission *despite obstacles and setbacks*

Resilience vs. Sustainability



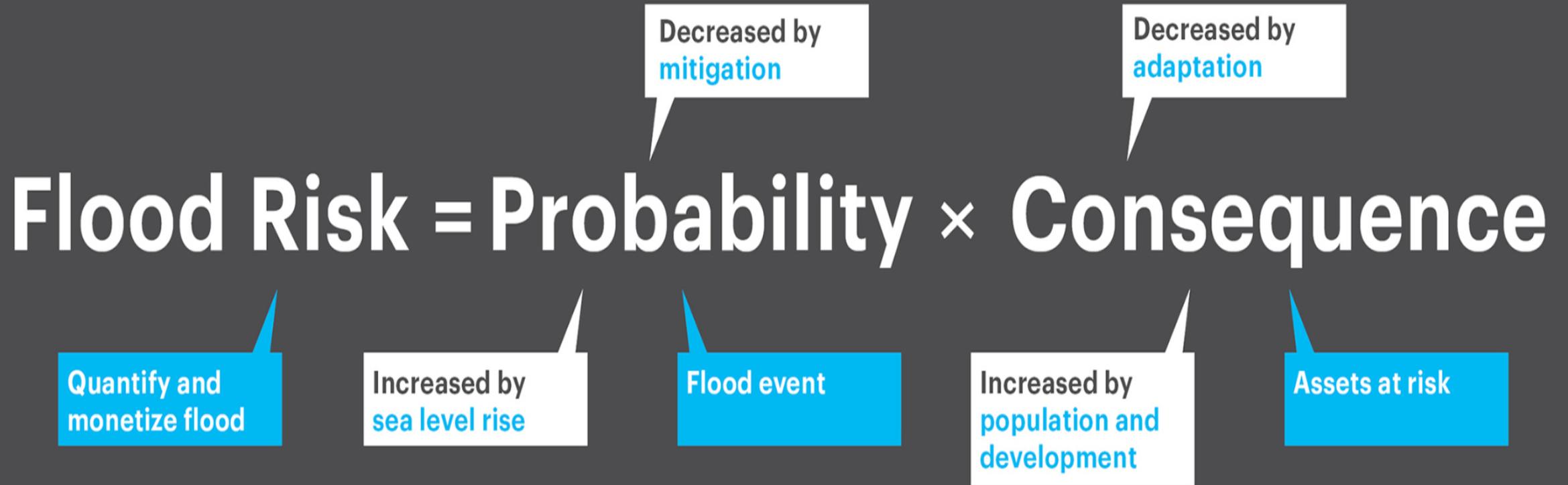
Get back up!



Endurance!

Sustainability: the ability to maintain a functioning, **thriving** Provincetown city *into the foreseeable future notwithstanding external disruptions.*

FLOOD RISK



INDIVIDUAL RISK

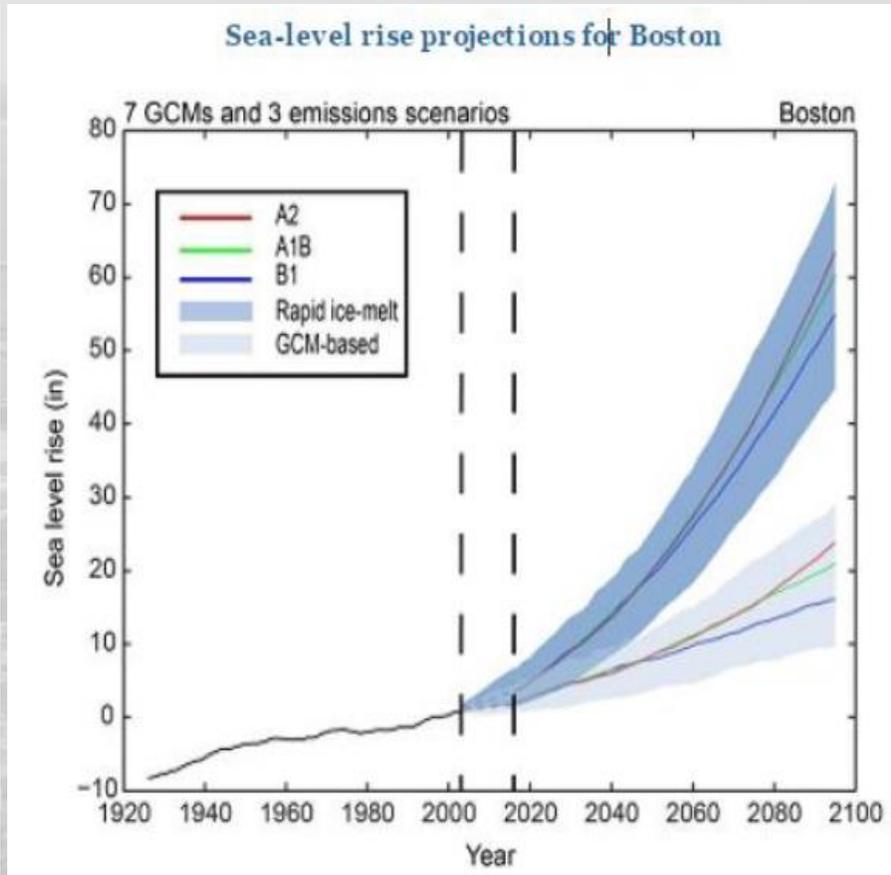
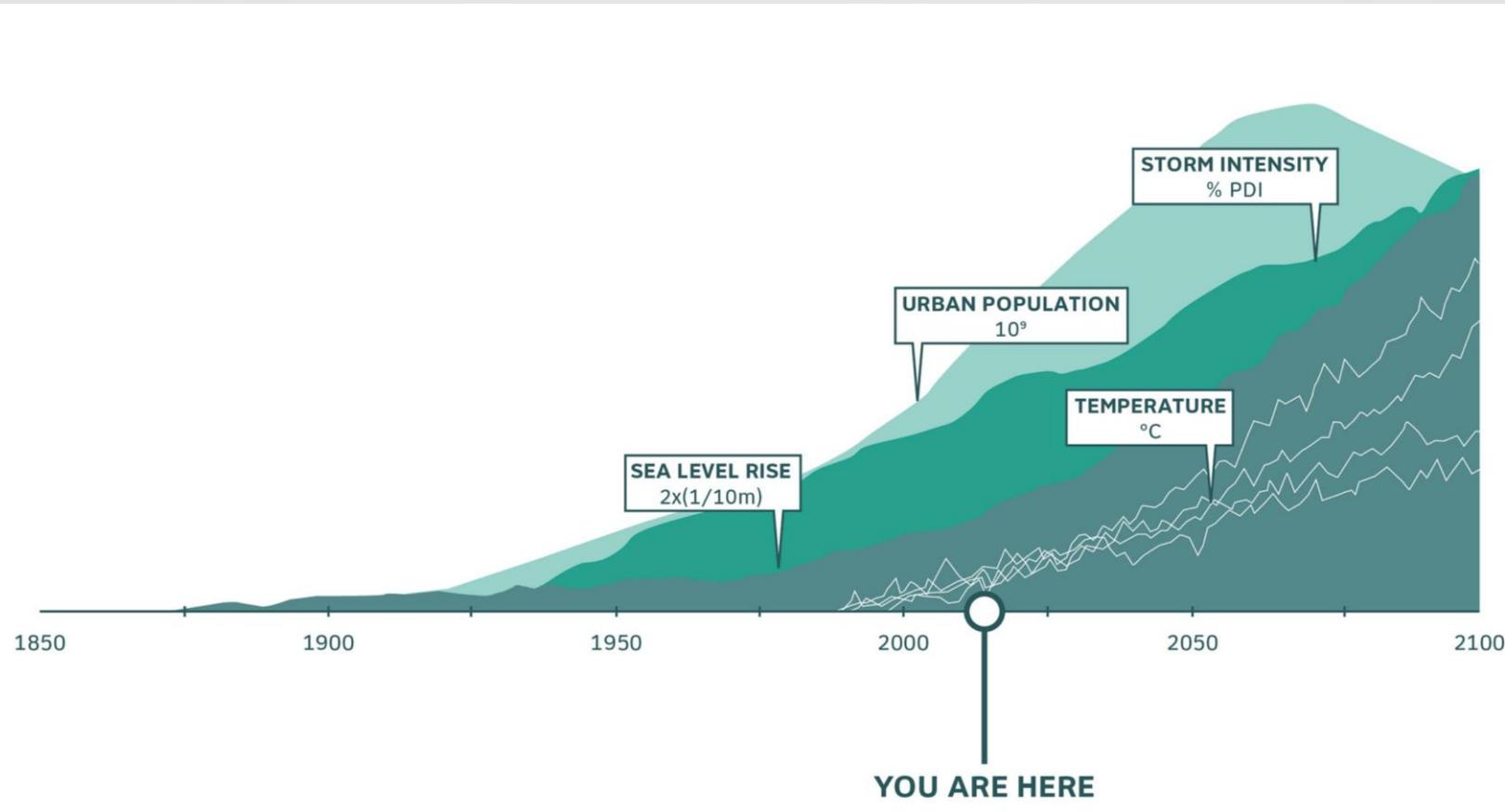
Experiencing a 100 year (1 percent annual chance) flood is about **five** times as likely as getting a flush in poker

In the flood zone, there is at least **1 in 4** chance that your home will be flooded before paying off your mortgage

In the flood zone you have a **55%** chance of experiencing a flood in your lifetime



The Trend Goes Up



Some Recent Examples



New York City, 2012
Superstorm Sandy



Houston, 2017
Hurricane Harvey



Boston, 2018
Winter Storm Grayson

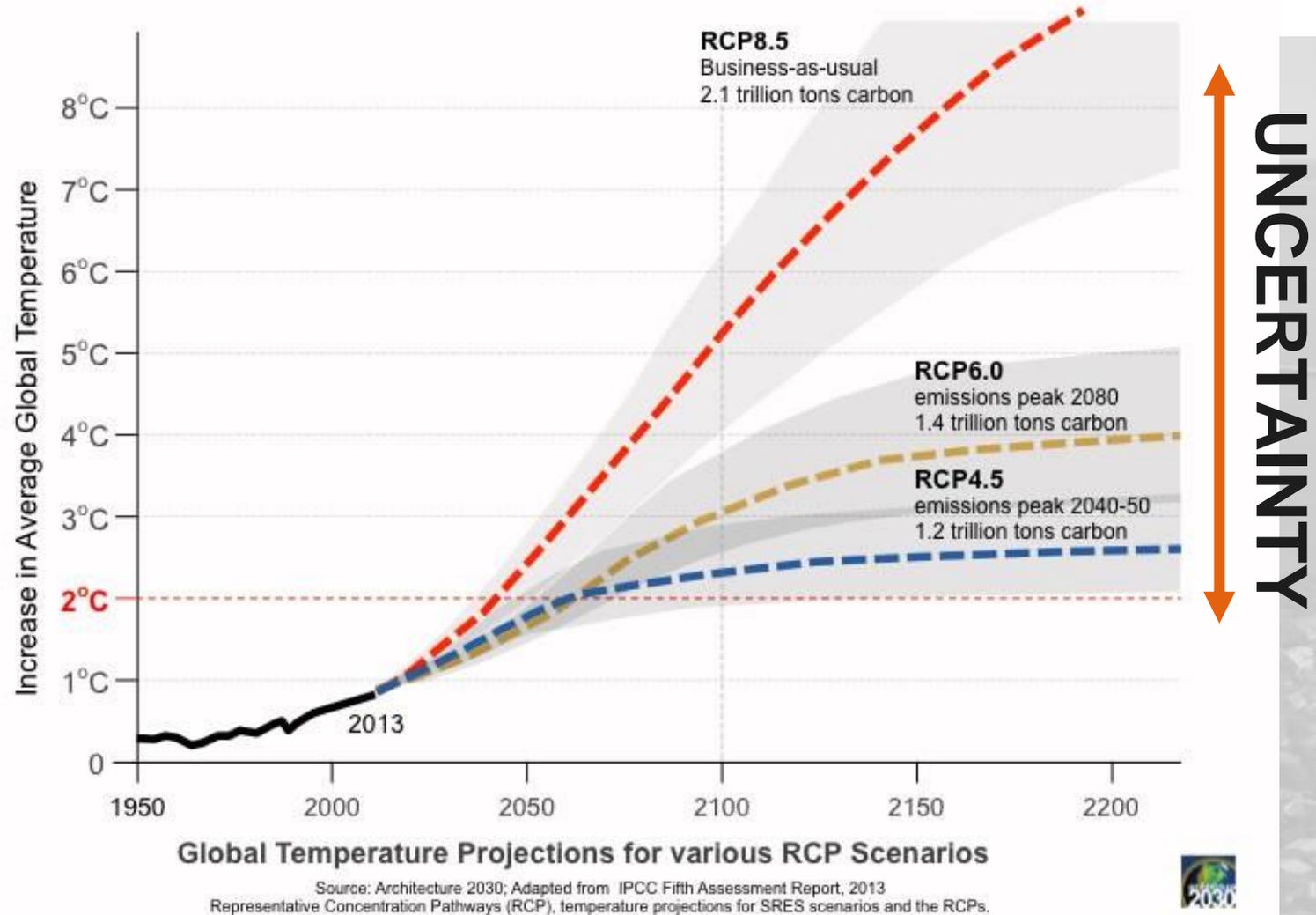


Some Recent Examples



Large uncertainty as to how quickly these changes will occur.

Image borrowed from C. Foster and P. Brashear Austin Rockefeller Workshop presentation



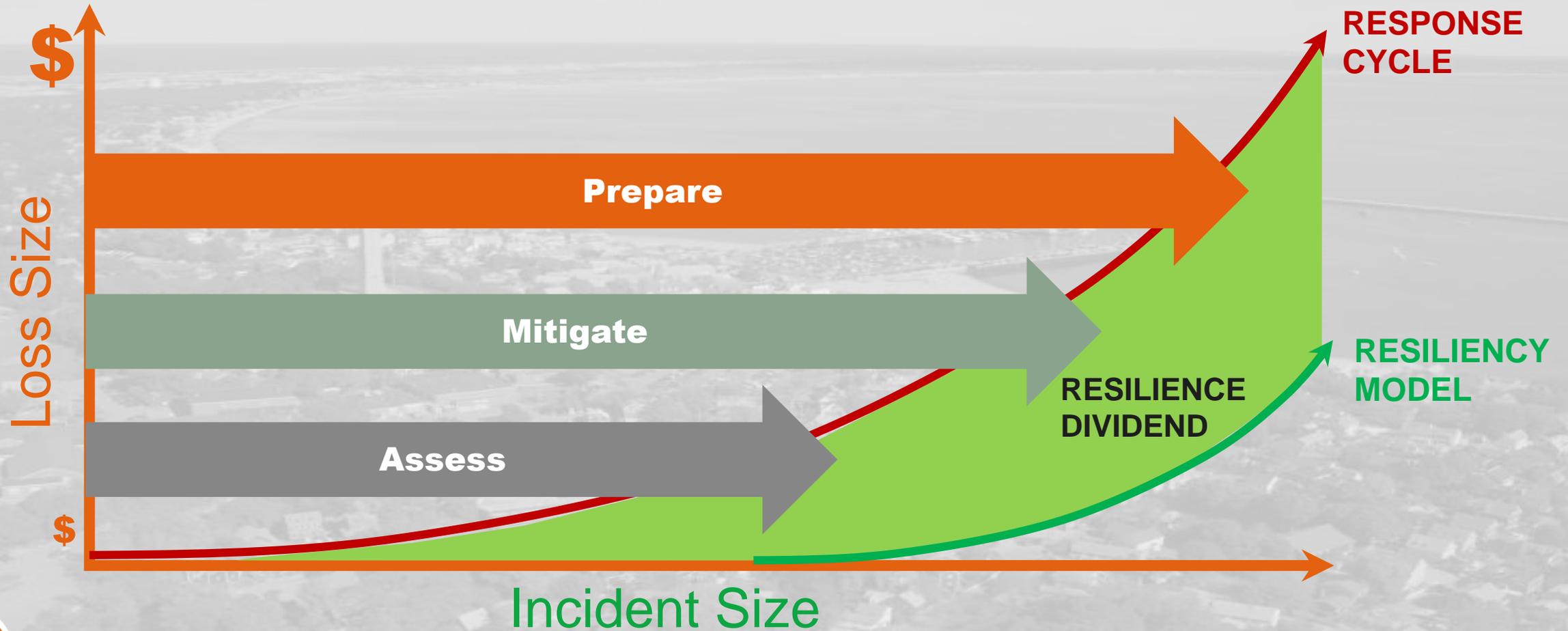
Resilience is NOT...



**WHAT WE
MUST DO IS...**



Break the Response Cycle



And leverage risk into opportunity



The Planning Cycle



Alignment across all links in the chain and all time horizons

“Whose responsibility is this?”

“Yours and yours and yours and yours...”



Risk versus National Flood Insurance Program (NFIP)



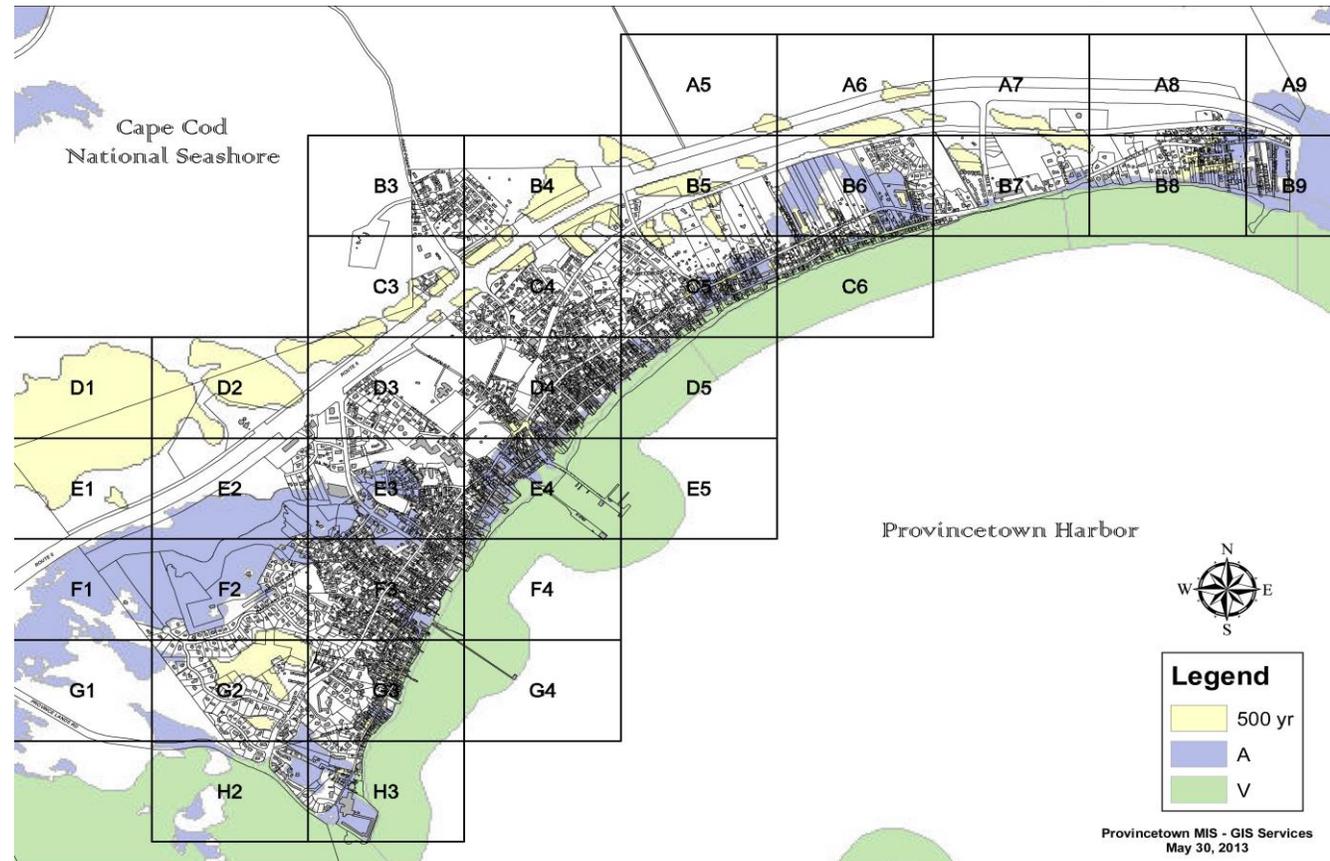
Understanding SHFA Zones

- **Base Flood Elevation (BFE):** the height above sea level that flood water is projected to rise in a 1%-annual-chance flood event
- **Zone VE (High Velocity Zone):** vulnerable to inundation by 1%-annual-chance flood event; further vulnerable to storm surge and direct wave action
- **Zone AE:** landward of V zones, vulnerable to inundation by 1%-annual-chance flood event
- **Zone AO:** vulnerable to inundation by 1%-annual-chance shallow flooding
- **Zones B, C, and X:** *not* SHFA zones, insurance *recommended* but not required



Provincetown's FIRM

FEMA Flood Insurance Rate Map



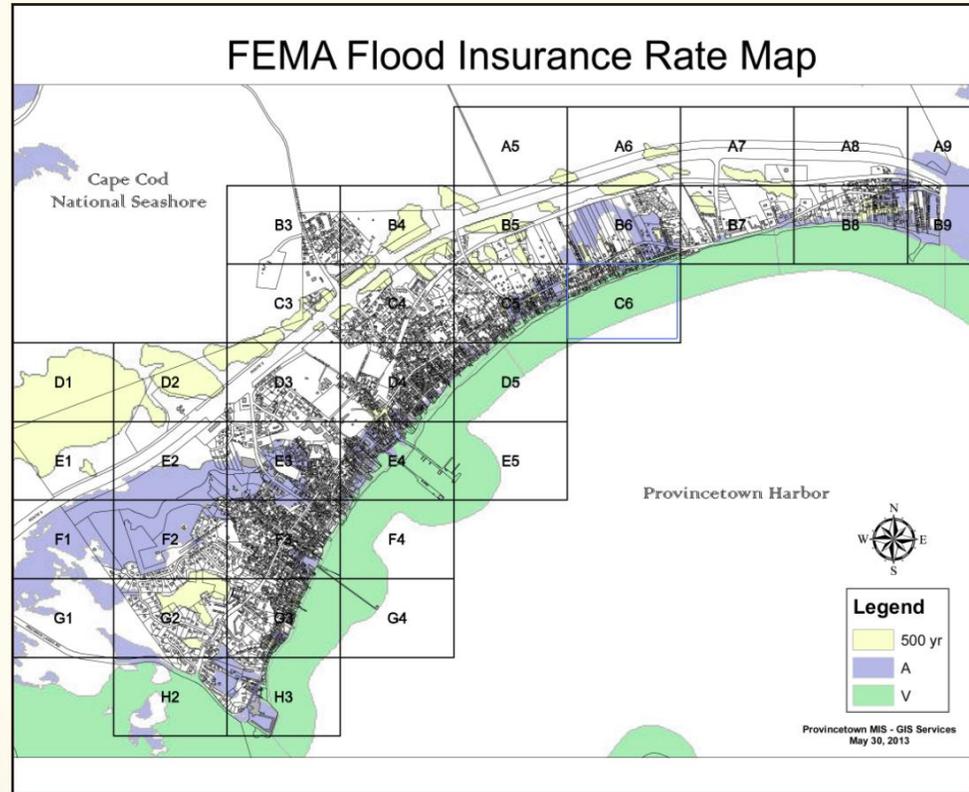
FEMA Map Service
Center:
<https://msc.fema.gov/portal>



Provincetown's Exposure

Provincetown Flood Plain Map

New Flood Zone Maps as of July 2014



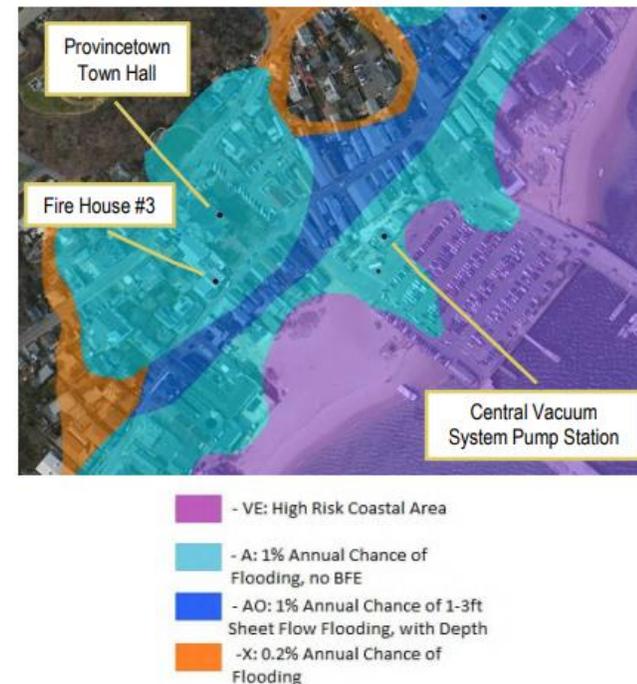
- **9 Repetitive loss structures**
 - 5 – residential
 - 4 – non-residential
- **Parcels in V Zone (284)**
 - 96 Single-Family
 - 94 Multi-Family
 - 94 Non-residential
- **Parcels in A Zone (668)**
 - 231 Single-Family
 - 194 Multi-Family
 - 243 Non-residential
- **Numbers increase dramatically with SLR**
- **Structures on Historic Register**



Provincetown's Town Assets

- **V Zones:** along the shore of Provincetown Harbor, Fire House #2, Water Transmission Mains from Truro, Route 6A Roadway, subsurface systems
- **A Zones:** Provincetown Airport, Municipal Parking Lot, Town Hall, Fire Station, Police Station

Figure 3-1: FEMA FIRM Map - Town Assets Within Floodplain Zones



Detailed criticality/inventory in 2016 *Increasing Coastal Resiliency and Reducing Infrastructure Vulnerability by Mapping Inundation Pathways* report

NFIP: Background

- Began in 1968
- Administered by FEMA
- Two objectives:
 - Provide insurance for property owners
 - Mitigate future flood damage
- 44 CFR 59 – 80
- Participating communities agree to enforce a ***floodplain management ordinance*** to NFIP minimum standards

Flood insurance is mandatory for properties with federally backed mortgages in ***Special Flood Hazard Areas (SFHAs)***



Standards

- Federal NFIP Minimum Standards: Title 44 CFR (Code of Federal Regulations) §60
- Existing state regulations
 - MA Wetlands Protection Act
 - MA Uniform Building Code
- Additional standards found in Provincetown's ***zoning bylaws***
 - Applies to new construction and substantial improvement



NFIP Coverage

- **Standard Flood Insurance Policy** pays up to the replacement cost of damages
 - Secondary homes include depreciation in valuation
- Two types of coverage, purchased separately:
 - Building property (up to \$250,000 residential, \$500,000 commercial)
 - Personal property (up to \$100,000 residential, \$500,000 commercial)
- Covers *direct* flood damage, only (losses due to direct contact with flood water)
- Limited coverage in basements, crawlspaces, enclosed areas under elevated buildings



What is covered?

Building Property

- The building and its foundation
- Electrical/plumbing systems
- Central air-conditioning, furnaces, etc.
- Permanently installed items

Personal Property

- Clothing, furniture, electronic equipment
- Portable appliances
- Certain valuable items (e.g., original artwork)

What is not covered?

- Damage caused by moisture/mildew/mold that could have been avoided
- Currency, precious metals, and valuable papers
- Property and belongings outside of a building (trees, wells, patios, pools, etc.)
- Living expenses, e.g., temporary housing
- Financial losses caused by business interruption or loss of use of property
- Most self-propelled vehicles such as cars



Basic NFIP Requirements

- Ordinances must be based on the *latest* FIRMs available
- A permit is required for *all* development in the SFHA
- Development must not increase flood hazard on other properties
- New, substantially improved, or substantially damaged buildings must be elevated above the BFE

Violation of these basic requirements by anyone in your community can jeopardize your NFIP coverage



Elevation of Historic Structures



National Historic Property
Current State Policy:

- **Exempt** from substantial improvement and substantial damage requirements
- **Not exempt** from foundation improvement requirements



Supplemental NFIP Policies



- **Increased Cost of Compliance (ICC) coverage**
 - Up to \$30,000 to help come into compliance with current building standards, if determined as substantially or repetitively damaged
 - For elevations, demolitions, relocations, and non-residential floodproofing

- **Preferred Risk Policy (PRP)**
 - For properties in lower-risk areas which are not legally required to have insurance
 - Can be as low as \$200 a year
 - Option to convert from an existing policy, if new FIRM indicates reduced risk



Minimizing Costs, Managing Risk

Rising Costs

- **Grandfathering:** lower-cost rating option for property owners carrying over a policy from before a FIRM update, or who built to correct standards relative to the FIRM at time of construction
 - **The Biggert-Waters Act (2012)** tried to phase out grandfathering rates in favor of actuarial risk
 - **HFIAA (2014)** temporarily reversed this, but don't rely on grandfathering



Rising Costs

- **Second homes/businesses** (approx. 60% of homes in Provincetown) – rates are higher
 - Average annual Provincetown SFHA premium: ~\$1,600
- Elevating a home can lower insurance premiums



FEMA Hazard Mitigation Assistance (HMA)

Hazard Mitigation Assistance




- **Hazard Mitigation Grant Program (HMGP)**
 - Post-disaster mitigation during reconstruction
- **Pre-Disaster Mitigation (PDM)**
- **Flood Mitigation Assistance (FMA)**
 - Available through the NFIP for mitigation projects and plan development

Cost-sharing requirements

- Generally pays up to 75%
- RL and SRL: up to 100% through FMA
- ICC claim payments can be used to contribute to cost-share



Examples of Eligible Project Activities

- Stormwater management projects
- Stormwater improvement projects
- Retrofits to infrastructure and facilities
- Erosion control projects
- Hurricane retrofits
- Power resiliency projects (generators and back-up power – HMGP, with PDM must be part of a larger project)
- Acquisition
- Elevation
- Floodproofing



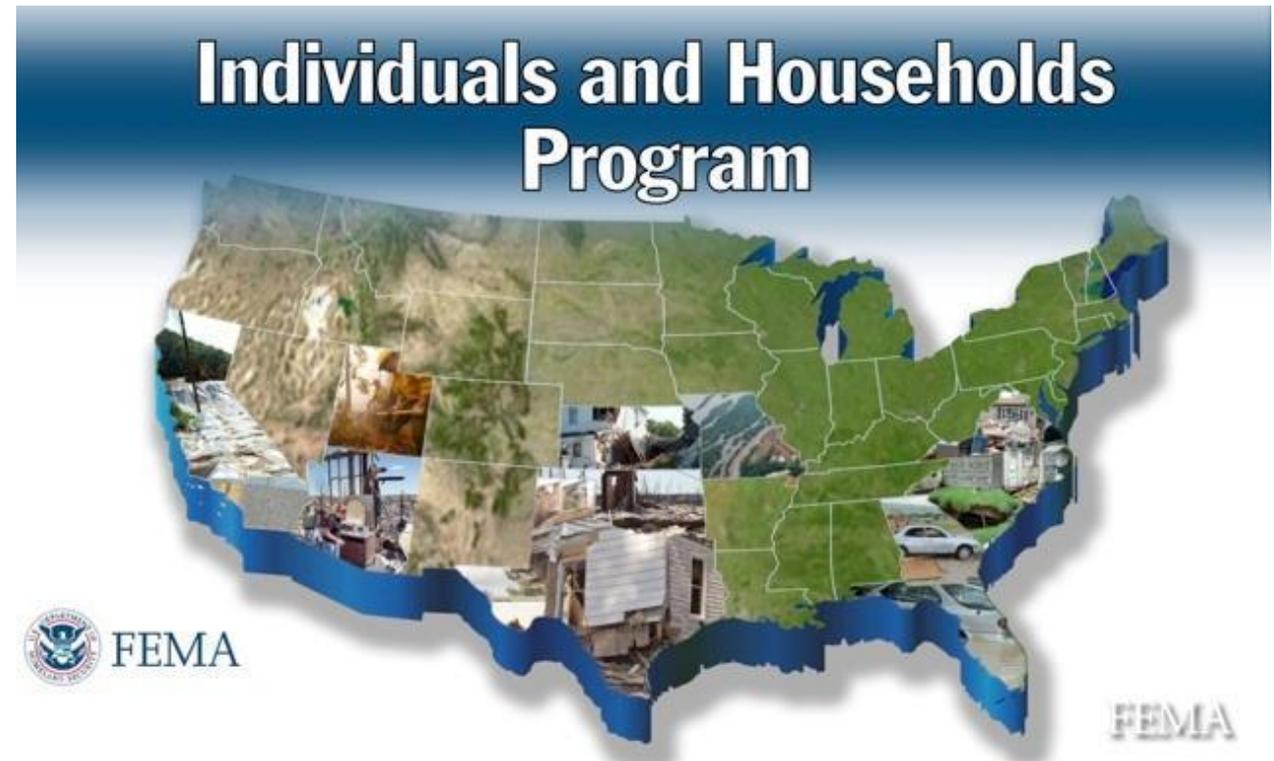
Examples of Eligible Planning Activities

- New state, regional, or local multi-hazard mitigation plan development (may be an annex into a larger plan)
- Comprehensive review and update of state, regional, or local multi-hazard mitigation plan
- Mitigation planning grant award must result in an adopted, FEMA-approved, multi-hazard mitigation plan prior to the end of the performance period
- For FMA, only a flood plan or the flood portion of the hazard mitigation plan would be eligible



Individuals and Household Program (IHP)

- **FEMA financial assistance & direct services** for those with *uninsured or underinsured* necessary expenses and basic needs
- **Not a substitute for flood insurance;** insurance is required to be eligible
- Limited to 18 months following a disaster declaration
- E.g., lodging expense reimbursement for displacement from primary residence; rental assistance; repair; etc.



203(k) Rehab Mortgage Insurance

- Provided through **HUD-approved mortgage lenders**
- Insured by the **Federal Housing Administration (FHA)**
- Finances **rehabilitation and repair** of single family properties
- For **homebuyers and homeowners**
- Funds for home improvement are **financed into** the mortgage amount
 - Current owners can refinance and stay in homes
- **Limited 203(k) Mortgage:** for smaller projects (up to a \$35,000 loan)



The Community Rating System (CRS)

- Voluntary NFIP incentive mechanism to encourage participating communities to exceed minimum NFIP floodplain requirements
- Communities earn credit and receive discounts
 - Improves overall resilience, reduces rates
- Class rating system (9 to 1)
 - Class 9 = 5% discount, Class 8 = 10%, etc. up to 45%
- Only 5% of Massachusetts NFIP communities participate
 - Including Provincetown!

Provincetown:

Currently a Class 9 (5% discount)

Barnstable County has an award for regional CRS planning





Non-physical flood risk adaptive measures:

- Zoning
- Land Use
- Floodplain mapping
- Flood insurance
- Flood warning
- Evacuation plans
- Emergency preparedness plans



Resources

- NFIP Laws and Policies: <https://www.fema.gov/national-flood-insurance-program-laws-regulations>
- FEMA Map Service Center: <https://msc.fema.gov/portal>
- FEMA's Map Information eXchange: 1-877-FEMA MAP
- Flood Smart: <http://www.floodsmart.com/>
- FEMA – How Do I File My Flood Claim? <https://www.fema.gov/nfip-file-your-claim>
- ASFPM Flood Mitigation Committee:
<https://www.floods.org/index.asp?menuID=247&firstlevelmenuID=183&siteID=1>
- Floodplain Management Bulleting on Historic Structures: <https://www.fema.gov/media-library/assets/documents/13411>
- FEMA P-312, Homeowner's Guide to Retrofitting: <https://www.fema.gov/media-library/assets/documents/480>
- Public Assistance Program and Policy Guide: https://www.fema.gov/media-library-data/1525468328389-4a038bbef9081cd7dfe7538e7751aa9c/PAPPG_3.1_508_FINAL_5-4-2018.pdf



What can property owners do to reduce risk?



If Flooded, Check Exterior for:



- Is the structure safe/overall condition
- Foundation cracking/settling
- Scouring around foundation, columns
- Windows not operating properly
- Wall sheathing, wet or warped
- Electrical/plumbing connections
- Heat pump/furnace



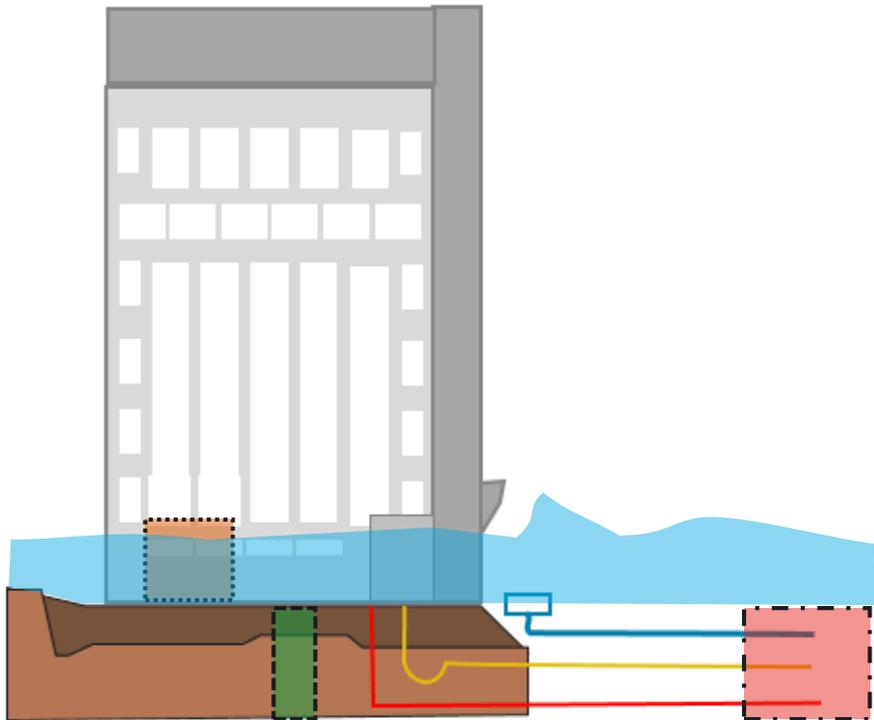
If Flooded, Check Interior for:



- Wet or sagging drywall
- Wet insulation
- Mold
- Duct work
- Electrical outlets
- Hardwood floors buckling
- Carpet
- Furniture



Assessing the Situation



Flood Characteristics

Flood depth, Flood velocity, Flood duration, Rate of rise, Debris/Ice flows, **Wave action (coastal)**, Floodway, Other(?)

Site Characteristics

Location, Soil type, **Topography**, Site size and space restrictions, Other(?)

Building/Structure Characteristics

Type of construction, Foundation, Condition of the building, Building Occupancy, Lower levels (Basement), **Historical Significance**, Other(?)

Other Considerations

Building Codes, Zoning Ordinances and Local Restrictions, Other Agencies (Local / State / Federal), Aesthetics, Public Health/Safety/Welfare, Other(?)



Flood Risk Adaptive Measures

Active measures require proper warning time and **human intervention** to set up, lock down, or deploy the flood-mitigation system to be able to protect against a flood event.

Passive measures require little or no warning times and little or **no human intervention**. The measures are already installed in place.



Flood Risk Adaptive Measures for homes



Elevation – Raising your home so that the lowest floor or lowest horizontal member is at or above the regulated flood level. You can accomplish this in several ways. (Chapter 5)



Relocation – Moving your home to higher ground where it will reduce the exposure to flooding. (Chapter 6)



Demolition – Tearing down your damaged home and either rebuilding on the same property or buying or building a home elsewhere. (Chapter 6)



Wet Floodproofing – Making portions of your home resistant to flood damage and allowing water to enter during flooding. (Chapter 7)



Dry Floodproofing – Sealing your home to prevent floodwaters from entering. (Chapter 7)



Barrier Systems – Building a floodwall or levee around your home to restrain floodwaters. (Chapter 8)

Source: FEMA, “An Overview of Retrofitting Methods”, https://www.fema.gov/media-library-data/1404149230242-8f5a97a5d9aa426b83e3fef354e8ffa8/FEMA_P312_Chap_3.pdf

Adaptive Measures Decision Matrix for homes

*Substantial Improvement / Substantial Damage

Retrofitting Methods Substantially Improved or Substantially Damaged Homes					
Evaluation Factors	Elevation ¹			Relocation	Demolition
	Elevation on Extended Foundation Walls	Elevation on Open Foundation	New Living Area over Abandoned First Floor		
					

NOT Substantial Improvement / NOT Substantial Damage

Retrofitting Methods for Homes NOT Substantially Improved or Substantially Damaged								
Evaluation Factors	Elevation			Relocation	Dry Floodproofing	Wet Floodproofing	Levees or Floodwalls	Demolition
	Elevation on Extended Foundation Walls	Elevation on Open Foundation	New Living Area over Abandoned First Floor					
								

*A flood risk mitigation method is considered a **Substantial Improvement** when its cost is 50% or more of the market value of the property being protected.

Source: FEMA, “Deciding Which Method is Right for your home”, https://www.fema.gov/media-library-data/1404149391152-4ce21d152d6eefafed8703fa99e206dd/FEMA_P312_Chap_4.pdf

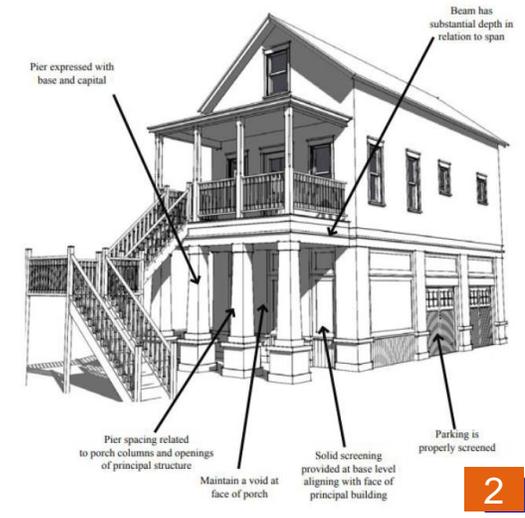
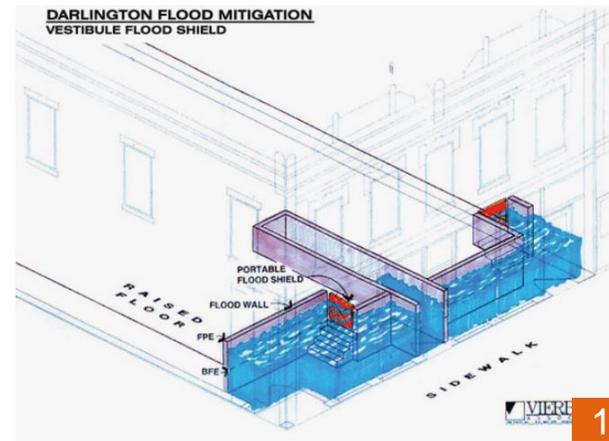
Flood mitigation for Historic Structures

Minimal Impact on character-defining features

- Relocate cultural resources to a safer location
- Create positive drainage around the building
- Protect mechanical and utility equipment
- Use flood resistant materials below the base flood elevation
- Install protections for openings
- Temporary barriers to reduce flood damages

Mitigation measures to further reduce flood risk

- Elevation of building
- Floodproofing
- Relocation



Sources:

- 1) FEMA, "Floodplain Management Bulletin, Historic Structures", https://www.fema.gov/media-library-data/20130726-1628-20490-7857/tb_p_467_2_historic_structures_05_08_web.pdf
- 2) Korjeff, S. "Cape Cod's Historic Structures in Flood Hazard Areas", Cape Cod Commission.

Contractor Considerations

Experience	Stability
<ul style="list-style-type: none">• <i>Recent successful mitigation projects</i>• <i>Positive References</i>• <i>Quality Products</i>• <i>Positive Auditing of recent projects</i>	<ul style="list-style-type: none">• <i>Licensed</i>• <i>Bonded</i>• <i>Proof of Insurance</i>
<ul style="list-style-type: none">• <i>State Licensing Agency</i>• <i>Better Business Bureau</i>• <i>Local Officials</i>• <i>Professional Associations</i>	<ul style="list-style-type: none">• <i>Written Estimate</i>• <i>Signed Contract</i>• <i>Guarantees and warranties in writing</i>• <i>Progress payments</i>• <i>Final payment after satisfaction and code compliance</i>
Reputation	Payments





Q & A

