



# Engaging in Adaptation

THE IMPORTANCE OF PUBLIC ENGAGEMENT WHEN PLANNING FOR  
ADAPTATION AND PRESERVATION

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TOWN OF PROVINCETOWN

# THE ROAD TO NOW...

- ▶ Coastal Resiliency: Climate Adaptation Planning for Provincetown's Historic District  
Tufts UEP Field Projects 2021  
Dunlevy | Francis | Gorman | Koncewicz | Petro | Rooney  
May 14, 2021
- ▶ Provincetown 2021 Hazard Mitigation Plan
- ▶ 2023-2024 Public Resilience Forums
- ▶ Development of Town-wide Coastal Resilience Plan began May 2024 with SCAPE, WHG, and EDR – final plan will be published later this month

# Engagement before the Plan



**Sherry Prada**  
Public Works Deputy Director  
Emergency Management  
Coordinator

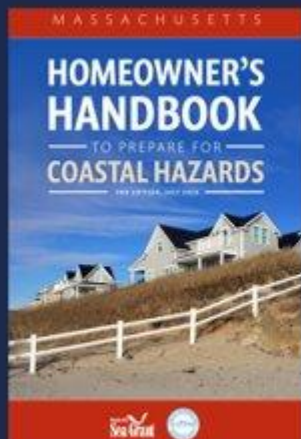
**Jim Vincent**  
Public Works Director



**Shelly McComb**  
Cape Cod Cooperative Extension  
Woods Hole Sea Grant  
Coastal Resiliency Specialist



**Kalliope Chute**  
Cape Cod Cooperative Extension  
Hazardous Materials Environmental  
Specialist  
Cape Cod Groundwater Guardian



## Cape Cod Coastal Planner and Adaptation Strategies Database

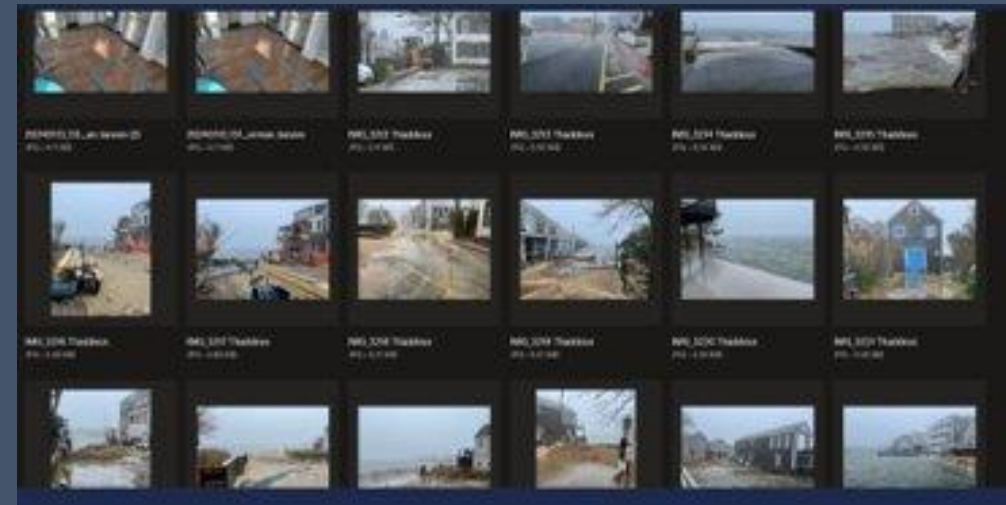
The Cape Cod Coastal Planner is an online, GIS-based educational tool intended to facilitate conversations and support community decision making around coastal resiliency issues.

## Adaptation Strategies

Adaptation strategies are actions that can be taken to protect an area from coastal hazards like sea level rise, storm surge, and erosion. The intention of the matrix is to organize information on the spectrum of resiliency strategies available, including where they may be used and the advantages and disadvantages of each.



Spectrum of Adaptation Strategies - the matrix includes a range of strategies from taking no action, to "green" or policy-based options, to "grey" engineering structure options.



# ENGAGEMENT TIMELINE



# PROJECT PURPOSE & GOALS



## DESIGN LIFE & ADAPTABILITY

- Does the strategy reduce flood/erosion risk for public infrastructure and critical Town assets?
- Does the strategy reduce flood/erosion risk for residents?
- Does the strategy reduce risk from high tide flooding?
- Does the strategy reduce risk from storm event flooding?
- Does the strategy reduce risk from stormwater flooding?
- Does the strategy reduce risk from address erosion?



## FEASIBILITY

- Is the strategy constructable/implementable?
- Can the strategy be permitted under current state and local regulations?
- Are the strategies free from operations or maintenance requirements?



## ENVIRONMENTAL & PUBLIC HEALTH BENEFITS

- Does the strategy provide water and air quality benefits?
- Does the strategy create or protect habitat?
- Does the strategy provide public health benefits?



## PROVINCETOWN'S UNIQUE CHARACTER

- Does the strategy reduce risk for local historic and cultural assets?
- Does the strategy consistent with community character?



## SOCIAL EQUITY & QUALITY OF LIFE

- Does the strategy provide recreational benefits?
- Does the strategy provide equitable benefits to all segments of the population?

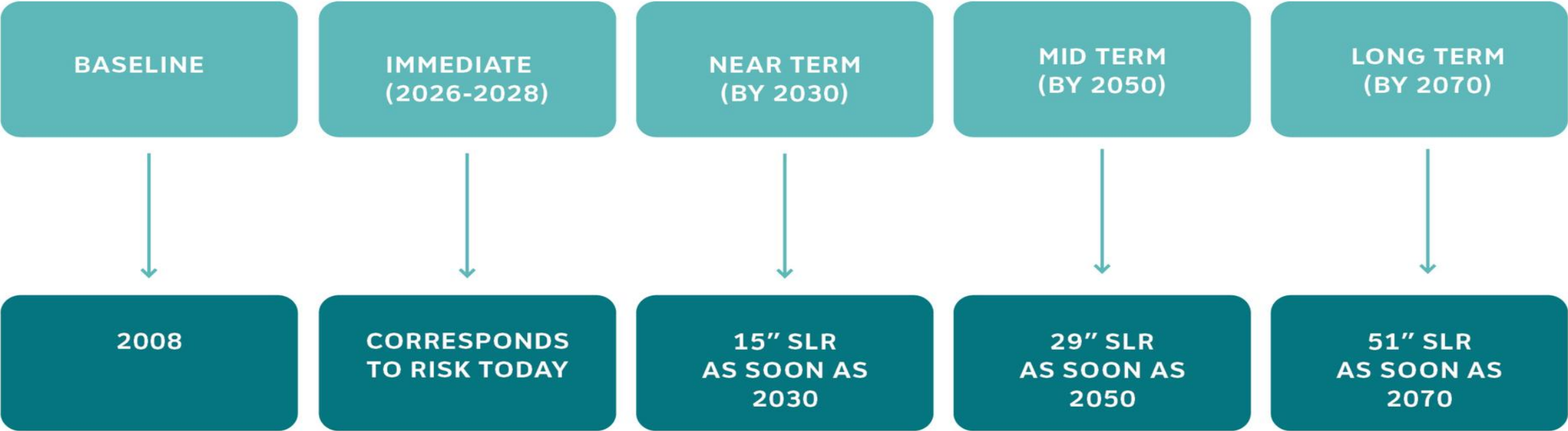


## ECONOMIC BENEFITS

- Does the strategy positively impact the tourism industry?
- Does the strategy positively impact property values?

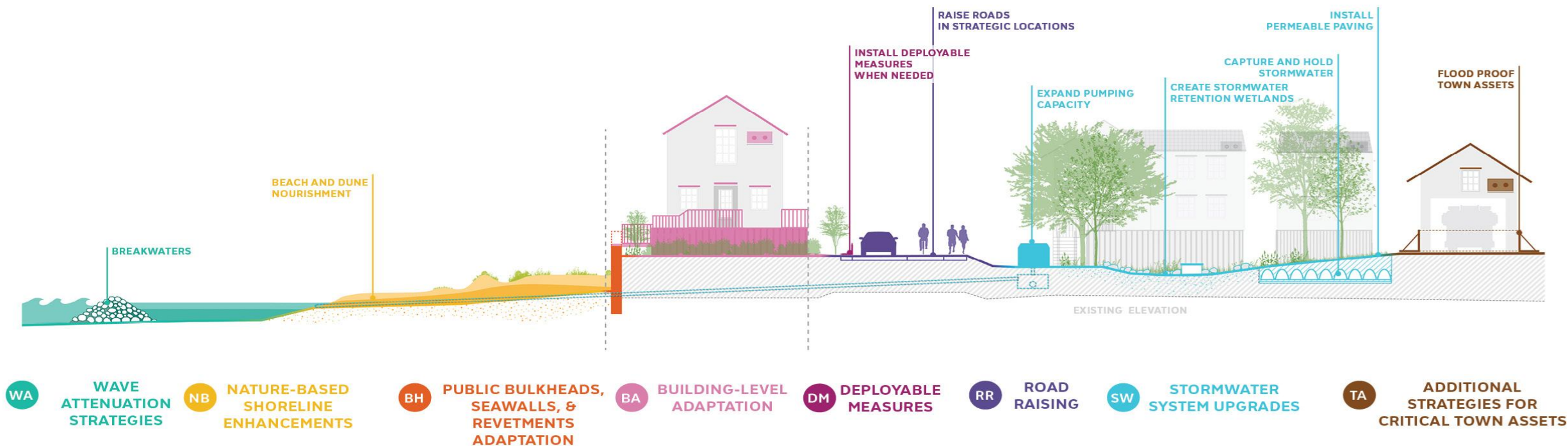


# ADAPTATION TIME HORIZONS



**SLR = SEA LEVEL RISE**

# A FLEXIBLE AND LAYERED APPROACH



# A FLEXIBLE AND LAYERED APPROACH



**WA WAVE ATTENUATION STRATEGIES**  
HAZARDS ADDRESSED: STORM EVENT FLOODING / COASTAL EROSION

Wave attenuation structures are designed to reduce the energy and impact of waves on coastal areas. These features can take many forms, including floating barriers, offshore breakwaters, living breakwaters or reefs, and redesigned structured shorelines. Typically installed offshore, they work by reflecting and dissipating wave energy before it reaches the shore.



**NB NATURE-BASED SHORELINE ENHANCEMENTS**  
HAZARDS ADDRESSED: HIGH TIDE FLOODING / STORM EVENT FLOODING / COASTAL EROSION

Nature-based strategies—such as beach nourishment, dune enhancement, and tidal marsh restoration—can help strengthen Provincetown's shoreline resilience while providing important ecological benefits. Beach nourishment involves adding compatible sand to widen and elevate the beach profile. Dune enhancement supports the health and growth of existing dune systems through planting native beach grasses, installing sand fencing, and modifying access pathways to allow natural dune movement. Tidal marsh restoration focuses on improving tidal exchange (or “flushing”) in marshes where hydrology has been restricted by development.



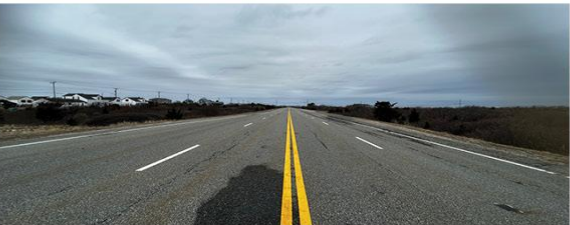
**BH RAISE TOWN-OWNED BULKHEADS, REVETMENTS & SEAWALLS**  
HAZARDS ADDRESSED: HIGH TIDE FLOODING / STORM EVENT FLOODING / COASTAL EROSION

Bulkheads and seawalls are engineered structures that protect shorelines by resisting erosion and coastal flooding. In Provincetown, the Town owns only a limited portion of these structures, as most are privately owned and maintained. Where the Town does have jurisdiction, it should raise its bulkheads and seawalls in alignment with the elevation guidance recommended for private property owners.



**DM DEPLOYABLE MEASURES**  
HAZARDS ADDRESSED: STORM EVENT FLOODING/STORMWATER FLOODING

Deployable flood barriers are temporary flood protection measures designed to be installed in advance of an anticipated flood event. Some systems are manually placed, while others can be automatically activated as storms approach. While these solutions offer flexibility, they can also present operational challenges, including limited nearby storage options and significant staffing requirements, which can be costly.



**RR ROAD RAISING**  
HAZARDS ADDRESSED: HIGH TIDE FLOODING / STORM EVENT FLOODING / STORMWATER

Raising low-lying sections of town-owned roadways to help prevent service disruptions and maintain access to key areas during high tides and flood events.



**SW STORMWATER SYSTEM UPGRADES**  
HAZARDS ADDRESSED: STORMWATER FLOODING

Stormwater system upgrades are intended to mitigate stormwater and compound flooding. They can be green or grey infrastructure and include measures to capture and infiltrate, convey, store, or discharge stormwater as well as measures to prevent coastal flooding from inundating the stormwater system.



**TA ADDITIONAL STRATEGIES FOR CRITICAL TOWN ASSETS**  
HAZARDS ADDRESSED: HIGH TIDE FLOODING / STORM EVENT FLOODING / STORMWATER FLOODING

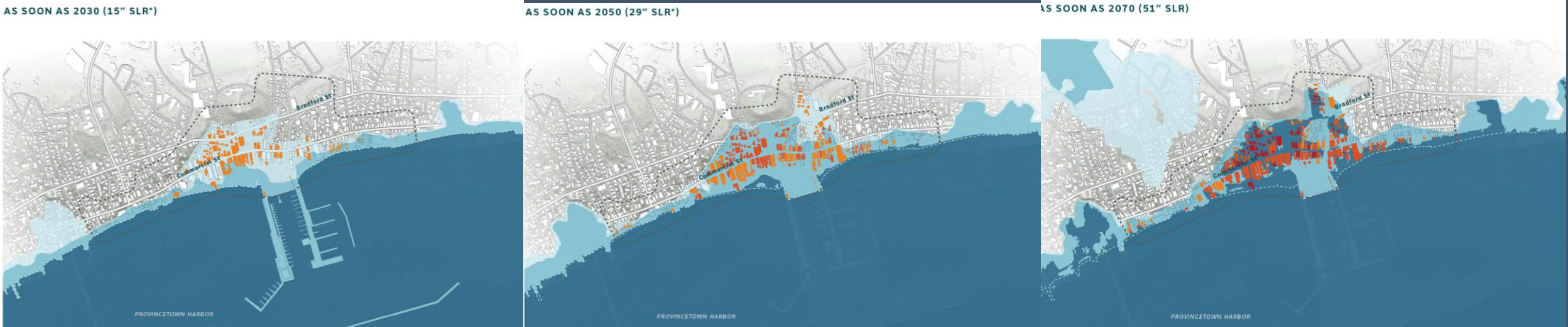
Adapt municipal properties and assets, such as Town Hall, fire stations, sewer and stormwater pump stations, and other low-lying municipal facilities, to reduce potential future damage and ensure they remain functional during storm events.



# DISTRICT 3 EAST END - FLOOD RISK



# DISTRICT 2 DOWNTOWN - FLOOD RISK




# PREPARE: RESIDENT STORM PREPARATION

PROVIDES RESIDENTS WITH  
IMPORTANT INFORMATION TO:

- Determine their flood risk.
- Prepare their property.
- Protect their family.
- Act after a storm.


# PREPARE

## RESIDENT STORM PREPARATION




### HURRICANES & TROPICAL STORMS

Provincetown experiences hurricane risk during the Atlantic hurricane season that runs from June 1st through to November 30th, with peak activity in mid-August and mid-October.




### STORM SURGE & FLOODING

Provincetown is particularly susceptible to storm surge and flooding as it is both coastal and mostly low lying. Flood risk increases during heavy rainfall and strong storm systems.



### NOR'EASTERS, SOU'EASTERS & BLIZZARDS

Provincetown experiences significant risk from winter storms. High winds, heavy precipitation, and storm surge can cause tidal and stormwater flooding during major winter storm events.



**PROVINCETOWN**  
MASSACHUSETTS

**SCAPE EDR** WOODS HOLE GROUP

SPRING 2025

## 4. SURVEY AFTER A STORM

- Assess property for damage, take photos for your insurance claim and contact your insurance company.
- Check in on friends, family and neighbors. See if anyone in your local area is need of assistance. Contact 911 if there is an emergency.
- Beware of hazards, avoid flood waters and steer clear of downed power lines.
- Clean up any debris and follow instructions on proper waste removal from county and local officials.

## RESOURCES

### EMERGENCY INFORMATION



National Weather Service, Boston



Regional Emergency Shelter System, Barnstable County



Massachusetts Emergency Management Agency



American Red Cross, Southeastern Massachusetts Chapter

Emergency Services  
911

### REPORT AN ISSUE



Natural Gas and/or Electric Outage: National Grid



Natural Gas and/or Electric Outage: Eversource



American Red Cross, Southeastern Massachusetts Chapter

Provincetown Police (Non-emergency)  
(508) 487-1212

Provincetown Fire (Non-emergency)  
(508) 487-7023

### AFTER STORM RESOURCES



Storm Debris Disposal, Barnstable County



Cape Cod Disaster Animal Response Team



Elder Services of Cape Cod and the Islands

### LEARN MORE



Hurricane Preparedness Tips, Massachusetts Emergency Management Agency



Massachusetts Homeowner's Handbook to Prepare for Coastal Hazards, Woods Hole Sea Grant & Cape Cod Cooperative



# ADAPT: HOMEOWNER RISK REDUCTION

- Educates homeowners on how to adapt their property to be better prepared for major storms and flood events.
- Outlines the best practices for adapting private property, including: retrofitting property; elevating structures; elevating bulkheads and sea walls; capturing, absorbing, and storing stormwater; and deploying flood barriers.



**ADAPT**  
HOMEOWNER RISK REDUCTION



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**STORM SURGE & FLOODING**

Provincetown is particularly susceptible to storm surge and flooding as it is coastal and mostly low lying. Flood risk increases during heavy rainfall and strong storm systems.



**STORMWATER FLOODING**

Provincetown can experience stormwater flooding when heavy rain overwhelms the drainage system.



**HIGH TIDE FLOODING**

Provincetown is projected to experience high tide flooding with future sea level rise.

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MASSACHUSETTS

**SCAPE EDR** WOODS HOLE GROUP

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## KNOW YOUR FLOOD RISK:

Check the FEMA Flood Map. Enter your address to view your proximity to flood zones.

SCAN ME!  
FEMA FLOOD MAP



Review future flood projections. Review the Provincetown Coastal Resilience Plan to understand potential future flood risk, considering sea level rise as soon as 2030, 2050, and 2070.

SCAN ME!  
PROVINCETOWN  
COASTAL  
RESILIENCE PLAN



## ADAPT YOUR PROPERTY:

### RETROFIT

- Elevate mechanical equipment, including electrical, heating, ventilation, plumbing, and air conditioning, to upper floors or above projected flood levels.
- Install design components on water, septic and sewer systems to prevent floodwater damage.
- Install an emergency backup power system.
- Elevate propane tanks above projected flood levels, and ensure they are secure and far from sources of heat.
- Install window protection, such as roll down shutters.
- Strengthen the roof to protect against wind uplift and stormwater damage.
- Reinforce foundations and piers.
- Fill basement with sand or gravel.
- Dry floodproof by sealing the building so that flood waters cannot enter - for insurance purposes, this is only allowed for non-residential structures. Homeowners can do this to reduce risk but it will not reduce insurance premiums.
- Wet floodproof by modifying the uninhabited portions of the house so that flood waters can enter without causing significant damage.
- Elevate the interior first floor if ceiling height allows.



ELEVATED HVAC

SEWAGE PUMP



BACKFLOW PREVENTION

ELEVATED PROPANE TANK



ROLL DOWN SHUTTERS

HURRICANE TIES



FILLED BASEMENT

DRY FLOODPROOF



WET FLOODPROOF

ELEVATED INTERIOR FIRST FLOOR

# Thank you!

To see the final plan and  
get updates and  
information on Resilience  
projects in Provincetown,  
use this QR code:



<https://www.provincetown-ma.gov/2517/Coastal-Resiliency-Information>