

Town of Harwich
Multi-Hazard Mitigation Plan

Table of Contents

Section 1: Introduction

Section 2: Hazard Identification and Risk Assessment

Section 3: Vulnerability Assessment

Section 4: Existing Local Hazard Mitigation Programs, Projects, & Activities

Section 5: Mitigation Strategy

Section 6: Implementation and Plan Adoption

Appendices

Map 1: Local Risk and Vulnerability Assessment /Critical Facilities and Infrastructure Map

Map 2: Hazard Risk Map I (historical tornadoes, historical earthquakes, landslides & shoreline change)

Map 3: Hazard Risk Map II (average annual snowfall, historical hurricanes)

Map 4: Hazard Risk Map III (local wildfire risk areas)

Section 1: Introduction

1.1 What is Hazard Mitigation?

In the context of natural disasters, ***hazard mitigation*** is commonly defined as any sustained action that permanently reduces or eliminates long-term risk to people, property, and resources from natural hazards and their effects.

In the context of this Local MHM Plan ***hazard*** refers to an extreme natural event that poses a risk to people, infrastructure, or resources. ***Risk*** can be defined as “hazard; danger; peril; exposure to loss, injury, or destruction” or “the possibility of suffering harm or loss.” The Town’s hazard risk assessment determines which areas of Town may be affected by a natural hazard, how likely it is that a given hazard may occur, and how intense that hazard might be.

Vulnerability can be defined as “susceptibility to injury or attack.” Vulnerability indicates what is likely to be damaged by the identified hazards and how severe the damage might be. For example, if an area is determined to be at risk of flooding, vulnerability estimates could include potential residential property losses, impacts to the tax base and damages to public infrastructure in that area.

Hazard mitigation planning is the process that the Local MHCPT underwent to analyze our Town’s risk from natural hazards, to coordinate available resources, and to develop a strategy to implement actions to eliminate risk.

1.2 Benefits of creating this plan for the town

The Town of Harwich has created this local multi hazard mitigation plan (hereinafter referred to as MHM Plan or the Plan) as a means to reduce future damage from natural hazard and to decrease the number of hazard areas and impediments to rescue/evacuation and clean-up that currently exist in the Town. This plan also serves as an overview of the Town's emergency preparedness and ways in which that system is either deficient or is compromised by hazards that can be addressed prior to an emergency situation. Also, in cases where hazards cannot be mitigated, alternative routes for rescue and evacuation can be put in place as well as measures to simply avoid hazard areas.

On a more practical level, completion and certification of the Plan will make the Town eligible for FEMA's Hazard Mitigation Grant Program funds and other federal and state hazard mitigation funds. A certified Plan will enable the Town to meet the requirements under the Federal Disaster Mitigation Act of 2000.

1.3 Participants

The following Town of Harwich Staff and Volunteers took part in the update of the 2011 plan:

Name	Position	Department
Lee Culver	Emergency Management Director	Police Department
Paula Champagne	Health Director	Health Department
William Flynn	Fire Chief	Fire Department
Norm Clarke	Deputy Fire Chief/ Telecommunications Supervisor	Fire Department
Craig Wiegand	Superintendent	Water Department
Thomas Gagnon	Police Lieutenant	Police Department
Lincoln Hooper	Director	Public Works Dept
David Spitz	Town Planner	Planning Department

This group was convened in an attempt to gain a well rounded view of the Town's assets and liabilities in relation to multi-hazard planning. In 2005, the plan was entitled the "Pre-Disaster Hazard Mitigation Plan". The Board of Selectmen was kept apprised of the progress of this plan. Stories in the local newspapers kept the public informed of the Plan, a copy of the plan was available for review on the Town's website, and a public hearing held at a Board of Selectmen's meeting allowed the public to comment. In addition, the hearing was televised and shown on local access cable television several times. The Board of Selectmen voted to accept the 2005 plan.

During the development of both the 2005 plan and the 2011 update, the Town also participated on the Regional Multiple Hazard Community Planning Team (convened by the Cape Cod Commission) where it was possible to interact with representatives from other Cape Towns, Barnstable County, State and Federal agencies.

1.4 Community Goal(s) for Hazard Mitigation

The primary goal for hazard mitigation in Harwich is the reduction in the loss of life, property, infrastructure, and environmental and cultural resources in the Town from natural disasters. In addition, the Town of Harwich is committed to coordinating local hazard mitigation planning and activities with those of Barnstable County and neighboring towns (Brewster, Dennis, Chatham and Orleans).

Section 2: Hazard Identification and Risk Assessment

2.1 Historical Storms and Damage

The coastal location of the Town of Harwich has made it subject to damage from natural disasters, particularly those associated with wind events (hurricane, blizzard, nor'easter). To spatially evaluate the range of potential hazards, a series of maps were developed by the Cape Cod Commission and reviewed by the MHM Team, including:

- Hazard Risk Map I** – showing historical occurrences of tornadoes, earthquakes, landslides and shoreline change (see Appendix, Map 2)
- Hazard Risk Map II** – showing average annual snowfall amounts and tracks of hurricanes that have affected Cape Cod (see Appendix, Map 3)
- Hazard Risk Map III** – local areas of wildfire risk and the wildland/urban interface (see Appendix, Map 4)

The range of risks identified by the MHM Team and shown on these maps that pose potential damage to life and property, listed from greatest to lowest risk, include:

Hurricane/Nor'easter

- Wind, high tide and storm surge depositing large boats on bridges on Lower County Road in West Harwich
- Flooding from high tide, storm surge and rain cutting off areas of Route 28 in East Harwich
- Storm surge/high tide resulting in flooding from the Herring River in West Harwich cutting off area from Nantucket Sound to Route 28
- Heavy rain causing significant flooding and property damage on Lovers Lane between Chatham Road and Bank Street in Harwich Center

Wind

- Wind driven snow has cut off access for several days to Headwaters Drive, the sole access to several hundred homes and a rehabilitation center
- Downed trees and downed power lines have blocked evacuation and rescue routes and posed potentially fatal hazards
- Wind driven snow causes significant drifts on roads adjacent to bogs, ponds and beaches, cutting off access and causing dangerous driving conditions

Snow and Ice Accumulation

- Snow and ice accumulation can cut off the evacuation route from Chatham along Route 137, particularly near Cemetery Road

Drought

- Potential for wildfires in areas of widespread low, dry brush.

2.2 Hazard Identification and Ranking

Historically, the Town of Harwich has sustained damage from flooding, storm surge, and high winds associated with hurricanes, nor'easters, and heavy rains. However, this plan and its mitigation strategy addresses multiple natural hazards, even those assessed with low probability. Risks to our town (and identified in Table 1, Hazard Ranking Matrix) include:

Table 1: Hazard Ranking Matrix				
Natural Hazard:	Location Rate: 1=small 2=medium 3=large	Frequency of Occurrence Rate: 0=unlikely 1=possible 2=likely 3=highly likely	Magnitude/Severity Rate: 1=limited 2=significant 3=critical 4=catastrophic	Hazard Ranking
Flood	3	2	3	8
Wind	3	2	2	7
Snow & Ice Accumulation	3	1	3	7
Shore line change (long term, sea level rise, or storm induced)	3	1	3	7
Wildfire	3	1	2	6
Tornado	2	0	4	6
Drought	3	1	1	5
Earthquake	2	0	1	3

Key to Table 1: Hazard Ranking Matrix

Location

- | | | |
|---|--------|--|
| 1 | Small | isolated to a specific parcel, building or neighborhood |
| 2 | Medium | occurring in multiple locations across town during one event |
| 3 | Large | affecting a significant portion of town during one event |

Frequency of Occurrence

- | | | |
|---|---------------|---|
| 0 | Unlikely | less than 1% probability in the next 100 years |
| 1 | Possible | between 1- 10% probability in the next year; or at least one chance in next 100 years |
| 2 | Likely | between 10 - 100% probability in the next year; or at least one chance in next 10 years |
| 3 | Highly Likely | near 100% probability in the next year |

Magnitude/Severity

1	Limited	injuries and/or illnesses are treatable with first aid; minor "quality of life" loss; shutdown of critical facilities or services for 24 hours or less; property severely damaged <10%
2	Significant	injuries and/or illnesses do not result in permanent disability; shutdown of several critical facilities for more than one week; property severely damaged <25% and >10%
3	Critical	injuries and/or illnesses result in permanent disability; complete shutdown of critical facilities for at least two weeks; property severely damaged <50% and >25%
4	Catastrophic	multiple deaths; complete shutdown of facilities for 30 days or more; property severely damaged >50%

Section 3: Vulnerability Assessment

The team responsible for the creation of this report was able to visually represent the challenges to the Town through the use of the Local Risk and Vulnerability Assessment/Critical Facilities and Infrastructure Map provided by the Cape Cod Commission (see Map #1). Over the course of several meetings, the team marked the areas on the map where the community is most vulnerable during storms and other natural disasters. The ability to see the areas marked on the map in reference to facilities and evacuation routes was helpful in assessing the issues that need immediate attention. It also gave the team the ability to map evacuation routes from neighboring towns and assess how they are impacted during storm events. In addition, notes were made directly on the map concerning other issues that arise during storms and other disasters that impact the Town's ability to effectively provide evacuation routes, emergency shelter and emergency services.

3.1 Vulnerability of built environment -- critical facilities and infrastructure

In Harwich the combination of overhead power lines, large trees and poor drainage on some roads leads to serious issues during storm events. Loss of power and the inability to navigate roads due to flooding, downed power lines and downed trees and limbs can isolate areas of Town and prevent residents from evacuating and necessary services from reaching stranded residents.

The area south of Route 28 is at a greater risk for several reasons. First, it is the most densely developed area of the Town of Harwich and includes an apartment and townhouse complex right on the water containing almost 300 units. Also, many of the roads leading into and out of this area are narrow. A number of the SLOSH zones in Harwich are located south of Route 28, creating significant problems for evacuation of this area. This is also an area with the largest concentration of ocean and riverfront homes, many of which would be susceptible to storm surges and flooding. Finally, many of the areas south of Route 28 are more prone to power outages than other areas due to the age and capacity of the lines serving some areas.

Another area at greater risk is the Route 28 corridor by Round Cove in East Harwich. This area is likely to flood during significant rainfall and storm surges. In addition, Route 28 is a major road between Chatham and Harwich and could be seen as an evacuation route from Chatham.

The team analyzed Map 1 and Map 4 and determined the following vulnerabilities (as identified on Map 1). Two of Harwich's local critical facilities are also regional facilities:

- Fontaine Medical Center (formerly Long Pond Medical Center)
- Cape Cod Regional Technical High School

The following critical facilities located on Map 1 are in risk areas:

- Public Safety Facility on Sisson Road is located in a SLOSH zone

- Harbormaster facilities at Allen Harbor, Wychmere Harbor and Saquatucket Harbor are all in SLOSH zones. Facilities at Allen and Saquatucket Harbors are in A zones. Facilities at Wychmere Harbor are in a V zone
- Holy Trinity Elementary School on Route 28 in West Harwich is in a SLOSH zone

Table 2 identifies the critical facilities and infrastructure in Harwich that are located in SLOSH zones or Wildfire Risk Areas while Table 3 identifies the areas in Town that the team determined to be hazard prone and vulnerable to damage. These locations should be considered when the Town develops its hazard mitigation strategy as there may be infrastructure projects in these areas that would be appropriate mitigation action items.

Table 2: Critical Facilities and Infrastructure, Harwich, Massachusetts					
#	Critical Facility or Infrastructure	Address	SLOSH (Y/N)	FIRM (Y/N)	Wildfire Risk Area (Y/N)
1	Public Safety Facility	Sisson Road	Y	N	N
28 29	Harbormaster facilities -- Allen Harbor	Allen Harbor	Y	Y	N
26 27	Harbormaster facilities -- Wychmere Harbor	Wychmere Harbor	Y	Y	N
13	Harbormaster facilities -- Saquatucket Harbor	Saquatucket Harbor	Y	Y	N
	Water Supply Wells	Townwide	N	N	Y
12	Water Tower	Route 39	N	Y	Y

It should also be noted that there are 8 critical facilities (including several water supply wells) located in the Wildland/Urban Interface as shown on the Wildfire Hazard Areas map. There are six critical facilities in SLOSH zones, and approximately 5.13 square miles of Harwich is located in SLOSH zones.

Table 3: Hazard Prone and Vulnerable Areas - Town of Harwich

Natural Hazard	Location	Frequency of Occurrence	Magnitude/ Severity
Flood	Route 28 -- Chatham line to Kendrick Road	Likely	Significant
	Herring River -- Nantucket Sound to Route 28	Highly likely -- sometimes floods at high tide without storm	Critical -- can cut off a portion of town
	Route 124 -- Seymour Road to and including Prince Charles Drive	Likely -- identified as problem area by Highways	Significant -- could impact Brewster evacuation
	Lower County Road -- Brooks Road to Wequasset Road	Likely -- identified as problem area by Highways	Significant -- could add to Herring River flooding
	Lovers Lane -- Bank Street to Chatham Road	Likely -- identified as problem area by Highways	Significant -- more for property damage than evacuation concerns
	Route 137 -- Round Cove Road to Pleasant Bay Road	Likely -- identified as problem area by Highways	Significant -- access to Route 6
	Route 137 at Fire Station	Possible -- identified as potential problem by Highways	Significant -- proximity to fire station
	Lower County Road at Brooks Road	Likely -- identified as problem area by Highways	Significant -- next to Allen Harbor -- See wind hazard
Wind	Lower County Road -- at Allen Harbor -- boats blow onto the roadway	Likely -- in extreme winds	Significant -- cuts off a major route through town
	Downed trees along major roads	Likely	Significant -- could cut off evacuation routes
	Downed power lines along major roads	Likely	Significant -- from downed trees

Natural Hazard	Location	Frequency of Occurrence	Magnitude/ Severity
	Headwaters Drive at Route 124 -- wind driven snow	Possible	Critical -- cuts off entire neighborhood and rehabilitation center
	All streets abutting ponds, bog, or beaches -- snow blows across flat surfaces and collects on roads	Likely with heavy snow	Significant
Fire	Thompson's Field	Possible	Significant
	Six Ponds Special District	Possible	Significant/Critical -- adjacent to significant development and regional roadway
	Power lines in North Harwich	Possible	Significant
Snow & Ice Accumulation	Headwaters Drive at Route 124 -- mainly wind driven snow	Likely	Critical -- cuts off entire neighborhood and rehabilitation center
	All streets abutting ponds, bog, or beaches -- snow blows across flat surfaces and collects on roads	Possible to likely in high wind	Significant
	Route 137 @ Cemetery Road	Likely in high wind	Significant -- Chatham evacuation route
	Route 28 -- Chatham line to Bay Road	Likely in high wind	Significant
Sea Level Rise	Anything bordering the Herring River	Likely	Critical
	Route 28 -- Chatham line to Kendrick Road	Likely	Significant

3.2 Number of people -- elderly, children in schools, tourists

Approximately 30% of the population of Harwich is over 65 years of age, creating many challenges during storm events, especially among those who are mobility impaired. In addition, the Town population (12,243 in the US Census 2010) more than doubles every summer from an influx of second homeowners and tourists who may not be familiar with the area or with the severe weather that can occur in this region.

Since not all severe weather occurs in the summer months, it is also important to consider the 1,350 students in the Harwich school system. There are three schools in the Harwich system -- an elementary school (which is also a shelter location), a middle school and a high school, all located in Harwich Center. Two other schools with significant numbers of students are Cape Cod Technical School in Pleasant Lake and Holy Trinity School in West Harwich. There are also several other private schools, private day care and pre-school facilities in Harwich.

The overall population of Harwich has declined slightly in the past decade. While new people are coming to the area every year, there are also a number of people who leave or die.

3.3 Development trends

Over the last several years, there have been an increasing number of major renovations/teardowns in the area south of Route 28 in South Harwich, Harwich Port and West Harwich. Many of these have taken place on properties near the ocean or on the Herring River. Only one of these properties is listed as a repetitive loss property.

There does not appear to be any sign that the redevelopment of the area south of Route 28 is slowing, as former summer cottages are turned into year-round homes, often significantly larger than the cottages they replaced. This is leading to an increase in year-round residents in these areas, and a larger population requiring evacuation in the event of a storm event during the off-season.

The rate of new development in Harwich has slowed in recent years. However, applications for subdivisions and Approval Not Required projects continue. As the economy rebounds, the rate of new home construction is likely to pick up again. Town planning efforts are seeking to concentrate new development in East Harwich and other village settings, away from hazard prone areas.

3.4 Shelter capacity

Harwich has several shelters. Two are located in Harwich Center (Community Center and Elementary School) and one is a regional shelter in Pleasant Lake (Cape Cod Regional Technical School).

3.5 Businesses forced to close

Often severe storm events are coupled with long periods without power and/or the emptying of the town by second homeowners and visitors. The impact to local businesses is two-fold. First, without power, most businesses cannot operate. Food businesses (restaurants, delis, small supermarkets) in particular are also faced with the spoilage of refrigerated and frozen foods. Second, in summer, the exodus of tourists and second homeowners prior to a storm event who sometimes do not return for weeks following the storm significantly reduces the number of patrons for businesses resulting in significant financial losses. During Hurricane Bob and the blizzard of 2005, most people in Harwich were without power for at least seven days.

3.6 Repetitive loss properties

Repetitive loss property is classified as any property that the NFIP has paid at least two flood damage claims of \$1,000 or more during a ten-year period beginning in 1978. At this time, Harwich has three repetitive loss properties, which are located on the Map 1, Risk and Vulnerability Assessment Map -- Critical Facilities and Infrastructure. Two are located in West Harwich on the Herring River, and one is located in East Harwich on Route 28 near Round Cove. These properties are a good indicator of where the Town can expect future damage to occur.

3.7 Wildfire Potential

There are several areas in Harwich that are at elevated risk for wildfires. The first is Thompson's Field, a conservation area of approximately 56 acres containing unfragmented forest and meadow areas. It is bordered by residential development to the east and west. Harwich conducted a Wildfire Assessment Plan for Thompson's Field in FY 2005 with funding from the Cape Cod Cooperative Extension.

A second area is the Six Ponds Special District, and area of limited development in the Pleasant Lake and East Harwich villages, north of Queen Anne Road and south of Route 6. The area contains approximately 1,200 acres of land and 114 acres of pond area. Hawksnest State Park contains over 200 acres of wooded land and ponds within this area. The majority of the land is currently undeveloped and many of these areas are bordered on all sides by dense residential development. Some of this development is accessible only by dirt roads.

A third area is in North Harwich where wooded land is traversed by electrical transmission lines. This area also contains extensive undeveloped wooded land in close proximity to dense residential development.

In addition, there are numerous landscaping businesses in Harwich that have compost and wood chip piles which can smolder and spontaneously combust depending on weather conditions and maintenance of the piles.

Section 4: Existing Local Hazard Mitigation Programs, Projects and Activities

Existing regulations, programs and activities currently used by the Town of Harwich to mitigate potential hazards are described in Table 4.

Table 4: Town of Harwich – Hazard Protection Matrix

Existing Protection	Description	Area Covered	Enforcement
Section IV – Flood Plain Zoning	Defines 100 Year Floodplain with Requirements for Compliance	100 Year Flood Plain (Zones A,AO,AH,AI-30, A-99, V and VI-30), FIRM 250006-005	Building Commissioner (with routing to other departments), Zoning Board of Appeals
Local Wetlands Protection By-Law	Regulates development within and adjacent to Wetland Resource Areas	Wetland Resource Areas with 50' and 100' protection buffers	Conservation Agent and Conservation Commission
Building Permits	Enforcement of Building Code to ensure compliance	Buildings and structures town-wide	Building Commissioner
Beach Renourishment Program	Beneficial re-use of dredged material to bolster shoreline protection	Town-operated beaches on Nantucket Sound and Pleasant Bay	Department of Public Works, Recreation Department
Comprehensive Emergency Management Plan	Establishes public safety response framework	Town-wide	Emergency Management Director
Subdivision Regulations	Requires underground utilities and drainage accommodating 25-year storm	Town-wide	Planning Board, Engineering Department
Site Plan Review	Requires underground utilities and drainage accommodating 25-year storm	Town-wide	Planning Board, Engineering Department
Wildfire Assessment and Preparedness Program	State and county programs to reduce potential fuel for wildfires	Town and state-owned open space parcels	Mass. Dept. of Conservation and Recreation, Barnstable Co. Cooperative Extension Service, Harwich Fire Dept.
National Flood Insurance Program (NFIP)	Federally-backed flood insurance available to homeowners, renters, and business owners	100 Year Flood Plain (Zones A,AO,AH,AI-30, A-99, V and VI-30), FIRM 250006-005	FEMA/Planning Department
Health Regulations	Establishes standards for construction of septic systems	Town-wide	Health Board, Health Department
Open Space Acquisition	Community Preservation Act funds are used to purchase sensitive lands	Town-wide	Real Estate and Open Space Committee

Section 5: Mitigation Strategy

This section outlines Harwich's overall strategy to reduce the Town's vulnerability to the effects of natural hazards.

5.1 Mitigation Objectives

The primary goal for hazard mitigation in Harwich is the reduction in the loss of life, property, infrastructure, and environmental and cultural resources in the Town from natural disasters. In addition, the Town of Harwich seeks to coordinate local hazard mitigation planning and activities with those of Barnstable County and neighboring towns (Brewster, Dennis, Chatham and Orleans). The following objectives, if fulfilled, will help Harwich achieve its mitigation goals:

- Objective #1: Preserve the natural and beneficial functions of the Town's floodplain, wetlands, beaches and dunes through continued support of natural resource protection policies and by discouraging growth in environmentally-sensitive areas.
- Objective #2: Enhance the Town's capability to conduct hazard risk assessments, demonstrate funding needs, and track mitigation activities throughout Harwich (whether directly as part of this plan, or indirectly through the normal course of business).
- Objective #3: Ensure that current emergency services are adequate to protect public health and safety. Ensure coordination with neighboring towns and County emergency services.
- Objective #4: Ensure that all new construction is completed using wind-resistant design techniques such as hurricane clips that will limit damage caused by high winds and reduce the amount of wind-borne debris.
- Objective #5: Maximize the use of available hazard mitigation grant programs to protect the Town's most vulnerable populations and structures.
- Objective #6: Work towards the elimination of the three local FEMA-identified "repetitive loss properties."
- Objective #7: Ensure that all critical facilities are protected from the effects of natural hazards to the maximum extent possible.
- Objective #8: Increase the level of knowledge and awareness of Town residents and property owners on the hazards that are potential threats to the area and of the preparedness measures that can and should be undertaken.

5.2 Mitigation Actions

In formulating its mitigation strategy, Harwich considered a wide range of activities in order to help achieve the goals of the community and to lessen the vulnerability of Harwich to the effects of natural hazards. In general, all of these activities fall into one of the following broad categories of mitigation techniques:

1. Prevention -- activities intended to keep hazards from exacerbating. They are especially effective in reducing the Town's future vulnerability. Examples include:

- Planning and Zoning
- Open space preservation
- Floodplain regulations
- Stormwater management
- Drainage system maintenance
- Capital improvements programming
- Shoreline setbacks

2. Property Protection -- to protect existing structures by modifying the buildings to withstand hazardous events, or removing structures from hazardous locations. Examples include:

- Land acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting
- Insurance

3. Natural Resource Protection -- activities intended to reduce the impact of natural hazards by preserving or restoring natural areas and their ability to mitigate impacts. Such areas include floodplains, wetlands and dunes. Recreation or conservation commissions often implement these measures. Examples include:

- Floodplain protection
- beach and dune preservation
- Riparian buffers
- Fire breaks
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

4. Structural Projects -- activities intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event. Examples include:

- Reservoirs
- Seawalls
- Diversions/detention/retention

- Channel modification
- Beach nourishment
- Storm sewers

5. Emergency Services -- activities intended to minimize the impact of a hazard event on people and property. These are commonly actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Evacuation planning and management
- Installing shutters for wind protection
- Warning systems

6. Public Information and Awareness -- these activities are used to advise residents, business owners, potential property owners, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property.

Examples include:

- Hazard map information
- Real estate disclosure
- Library materials
- Education of hotel and motel owners
- Materials geared to tourists

The fifteen action items (the 2005 plan listed eighteen action items – three have been completed or removed due to infeasibility) proposed for Harwich to undertake are listed below. Each includes the following general information:

- Hazard it is designed to mitigate
- Objectives it is intended to achieve
- General background information
- Agency/person assigned responsibility for carrying out the action
- Priority level for its implementation
- Potential funding sources, if applicable
- Target completion date

These mitigation measures are short-term, specific measures to be undertaken by the Town in order to achieve the Town's mitigation goals and objectives. It is anticipated that this component of the plan will be the most variable over time. This list of action items will be used as the primary indicator to measure the plan's progress over time and will be updated and/or revised periodically through future planning efforts.

Action Item #2	Continue participation and maintain standing in the NFIP's Community Rating System (CRS) program through enhanced floodplain management activities.
Hazard it is designed to mitigate:	Flood

Objective it is intended to help achieve:	1
General background of item:	Continued certification in CRS requires completion of annual tasks including notification of realtor's and insurers regarding availability of floodplain information, providing information to repetitive loss properties and maintaining elevation certificates for construction in the floodplain.
Responsibility for implementation assigned to:	Planning Department, Building Department
Potential funding source:	Operating budget
Priority/ time frame for implementation (or target completion date if possible):	High/September of every year

Action Item #3	Continue a standing Multi-hazard Mitigation Committee
Hazard it is designed to mitigate:	All
Objective it's intended to help achieve:	2
General background of item:	Bring together representatives of public safety, public works, conservation, health and others to share information on areas concerning multi-hazard mitigation and keep an open dialogue on areas of concern and potential mitigation.
Responsibility for implementation assigned to:	Planning Department, Board of Selectmen
Potential funding source:	Operating budget
Priority/ time frame for implementation (or target completion date if possible):	Moderate/On-going

Action Item #4	Use the Town's evolving Geographic Information System (GIS) to maintain current building and parcel data for the purpose of conducting more detailed hazard risk assessments and for tracking permitting/land use.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	1, 2, 4, 6, 7
General background of item:	A GIS system coordinated between several Town departments will allow for the ability to collect, collect, manage, analyze and display spatially referenced data to further

	hazard mitigation goals.
Responsibility for implementation assigned to:	Planning Department, IT Director, Water Department, Assessing Department
Potential funding source:	Operating budget, capital budget, grants
Priority/ time frame for implementation (or target completion date if possible):	High/On-going

Action Item #5	Continue to supply educational materials on preparedness/mitigation for property owners, for display and distribution at Town Hall, Brooks Free Library, Community Center
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	4, 5, 8
General background of item:	Some information currently exists, but needs to be updated, and available in more locations.
Responsibility for implementation assigned to:	Conservation, Health, Public Safety, Library, Community Center
Potential funding source:	Operating budget
Priority/ time frame for implementation (or target completion date if possible):	High/On-going

Action Item #7	Maintain an inventory of the Town's most at-risk locations identified in the Vulnerability Analysis and evaluate potential mitigation techniques for protecting each location to the maximum extent possible.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	2, 3, 4, 6, 7
General background of item:	An inventory of the Town's critical facilities should be created and maintained by the Town, and include information on the risk to each location and possible mitigation measures. Non-town owned at-risk locations should also be inventoried.
Responsibility for implementation assigned to:	Highways and Maintenance, Public Safety, Conservation, Building Department
Potential funding source:	Town Meeting, Grants
Priority/ time frame for implementation (or target completion date if possible):	High/2012

Action Item #8	Monitor the Town's emergency services to identify needs in terms of personnel, equipment and/or required resources.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	3
General background of item:	Identified needs or shortfalls should be documented and result in specific recommendations to the Board of Selectmen.
Responsibility for implementation assigned to:	Police Department, (Fire Department has completed an initial evaluation), Health Department
Potential funding source:	Operating Budget
Priority/ time frame for implementation (or target completion date if possible):	High/On-going

Action Item #9	Incorporate the inspection and management of hazardous trees/limbs into the Town's routine monitoring process.
Hazard it is designed to mitigate:	Wind, Snow & Ice
Objective it is intended to help achieve:	2, 7
General background of item:	Harwich's ability to recognize and prevent hazardous tree conditions (through inspection, pruning or removal) is the best defense against problems and damage caused by tree failure (such as property damages, power outages and fires). Specifically, trees located on Town properties which pose immediate threats to property, utility lines and other crucial facilities should be addressed.
Responsibility for implementation assigned to:	Highways and Maintenance, Public Safety
Potential funding source:	Operating Budget, Grants
Priority/ time frame for implementation (or target completion date if possible):	High/On-going

Action Item #10	Enforce the State Building Code for wind-resistant design and building techniques for new construction and reconstruction during the Town's
------------------------	--

	permitting process. Provide information for homeowners and builders.
Hazard it is designed to mitigate:	Wind
Objective it is intended to help achieve:	4
General background of item:	The Town currently offers verbal advice to homeowners and builders regarding additional building practices for wind loss reduction. A brochure or other document outlining additional measures should be produced by the Town for use by building contractors and home buyers.
Responsibility for implementation assigned to:	Building Department
Potential funding source:	Operating Budget/Grant
Priority/ time frame for implementation (or target completion date if possible):	Moderate/2012

Action Item #11	Quantify potential losses by estimating such losses at varying degrees of storm surge, wind and stormwater hazard severity, as well as specific impacts on critical facilities. This should be performed for the plan's five year update.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	1, 2, 4, 7, 8
General background of item:	With limited GIS capability at the Town level, seek Cape Cod Comm. assistance to develop a building footprint data layer that will assist in the estimation of potential losses at varying degrees of storm surge, wind and stormwater hazard severity.
Responsibility for implementation assigned to:	Town Planner
Potential funding source:	Operating Budget/Grants
Priority/ time frame for implementation (or target completion date if possible):	Moderate/2013

Action Item #12	Conduct an educational workshop for coastal and riverfront landowners and contractors on hazard mitigation.
Hazard it is designed to mitigate:	Flood, Wind, Erosion, Sea Level Rise
Objective it is intended to help achieve:	1, 4, 8

General background of item:	Development pressure continues as dwellings are razed and reconstructed in hazard prone areas. The workshop would be an opportunity to educate the public and the building community.
Responsibility for implementation assigned to:	Town Planner, Building Department, Conservation Commission
Potential funding source:	Operating Budget/Grant
Priority/ time frame for implementation (or target completion date if possible):	High/2012

Action Item #13	Develop a list of mitigation projects, including but not limited to: snow fencing in areas prone to blowing and drifting snow, and regrading and improved drainage in areas prone to flooding.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	5
General background of item:	The Town should develop a list of potential projects that is periodically updated so that a project can easily be paired with grant funding as it becomes available.
Responsibility for implementation assigned to:	Public Safety, Highways and Maintenance, Town Planner
Potential funding source:	Operating Budget
Priority/ time frame for implementation (or target completion date if possible):	High/2012

Action Item #14	Mitigate impacts of blowing/drifting snow.
Hazard it is designed to mitigate:	Wind, Snow and Ice
Objective it is intended to help achieve:	1, 7
General background of item:	Blowing and drifting snow has caused areas of Harwich to be cut off from emergency services, and require heavy equipment to remove snow.
Responsibility for implementation assigned to:	Public Safety, Highways and Maintenance
Potential funding source:	Operating Budget, grant funding
Priority/ time frame for implementation (or target completion date if possible):	High/On-going

Action Item #15	Provide communication equipment to emergency management.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	3, 5, 7
General background of item:	Improvements have been made in connection with the Town's new Public Safety Facility. Further improvements will allow the Emergency Management Director to stay in touch with a variety of staff including public safety, shelter personnel, Highways, and Town administration.
Responsibility for implementation assigned to:	Emergency Management
Potential funding source:	Operating Budget/Grants; Barnstable County Regional Emergency Planning Committee
Priority/ time frame for implementation (or target completion date if possible):	Moderate/2013

Action Item #17	Continue the Town's participation in the Cape Cod Cooperative Extension's Wildfire Assessment and Preparedness Program by submitting an application during each grant round.
Hazard it is designed to mitigate:	Wildfire
Objective it is intended to help achieve:	5, 7
General background of item:	Harwich has applied for and received funding for the Thompson's Field high wildfire hazard area. There are other areas/properties in town on which such an assessment should be done and a plan prepared.
Responsibility for implementation assigned to:	Harwich Fire Department, Planning Department
Potential funding source:	Grant Funding – Barnstable County
Priority/ time frame for implementation (or target completion date if possible):	High/ ongoing

Action Item #18	Establish a Memorandum of Agreement/Understanding with the Town of Brewster, and other adjacent towns, regarding the coordinated opening of storm shelters and to ensure adequate shelter capacity for the area.
Hazard it is designed to mitigate:	All
Objective it is intended to help achieve:	3, 8
General background of item:	Shelter space has been adequate in the past but there is risk of overburdening the shelters in the future due to the regional nature of their use.
Responsibility for implementation assigned to:	Emergency Management
Potential funding source:	None needed
Priority/ time frame for implementation (or target completion date if possible):	High/ 2012

5.3 Prioritization of Action Items

Actions that will be undertaken in Harwich are consistent with both the State and Barnstable County's approach of using non-structural hazard mitigation actions prior to considering a structural approach. A *non-structural* hazard mitigation approach is a strategy that does not change the natural hazard, but involves preventative actions that improve infrastructure to reduce the damages, or improve coordination of resources. A *structural* hazard mitigation approach involves strategies that inhibit a natural hazard, such a sea wall or dam.

The items listed above in Section 5.2 provide a laundry list of activities to undertake for mitigating future damages and/or losses of life based upon the analysis conducted in the MHM Plan. To place them in a context recognizing potential constraints to implementation, the MHM Team considered each action item and determined its feasibility by using the STAPLEE method, as did the Barnstable County Natural Hazards MHM Plan (Regional MHM Plan). Refer to Section 5.4 of the Regional MHM Plan for a full explanation of the correlation between feasibility and priority and why the MHM Team "weighted" the STAPLEE with the hazard rankings that were determined in Table 1 herein. STAPLEE is an acronym for a general set of criteria used to make decisions regarding community initiatives, standing for social, technical, administrative, political, legal, economic, and environmental decision-making criteria. Using these criteria, the MHM Team determined the overall feasibility of the 15 action items (see Table 5 below).

INSERT EXCEL FILE –STAPLEE Table 5

DRAFT

Section 6: Implementation and Adoption of this Plan

6.1 Adoption

A duly noticed Public Hearing was held by the Board of Selectmen to take public comment and explain the purpose of the plan. Public comment has been received, considered and incorporated into the plan as appropriate.

The Harwich Board of Selectmen voted to adopt the Natural Hazards Pre-Disaster Mitigation Plan for the Town of Harwich on _____, 2011, following the public hearing.

6.2 Implementation

The MHM Plan will be implemented through the delegation of assignments by the Town Administrator. Mitigation Action Items have each been assigned a responsible department and the individual department heads will be charged with overseeing the specific tasks assigned to them. It shall be the responsibility of the Town Administrator to ensure that the action items set forth in this plan are carried out in accordance with the time frame assigned to each action item. The Town Administrator shall also see fit to amend these action items with regard to departmental responsibilities, time frame, and funding source.

6.3 Annual Reporting and Monitoring

Periodic monitoring and reporting is required to ensure that local mitigation efforts are being carried out.

The MHM Plan shall be reviewed annually by the MHM Team or other group as designated by the Board of Selectmen. More frequent review shall be conducted as situations dictate, such as following a disaster declaration. Each year, the Town Administrator will assign responsibility for conducting this annual review to an appropriate individual or department, who will ensure the following:

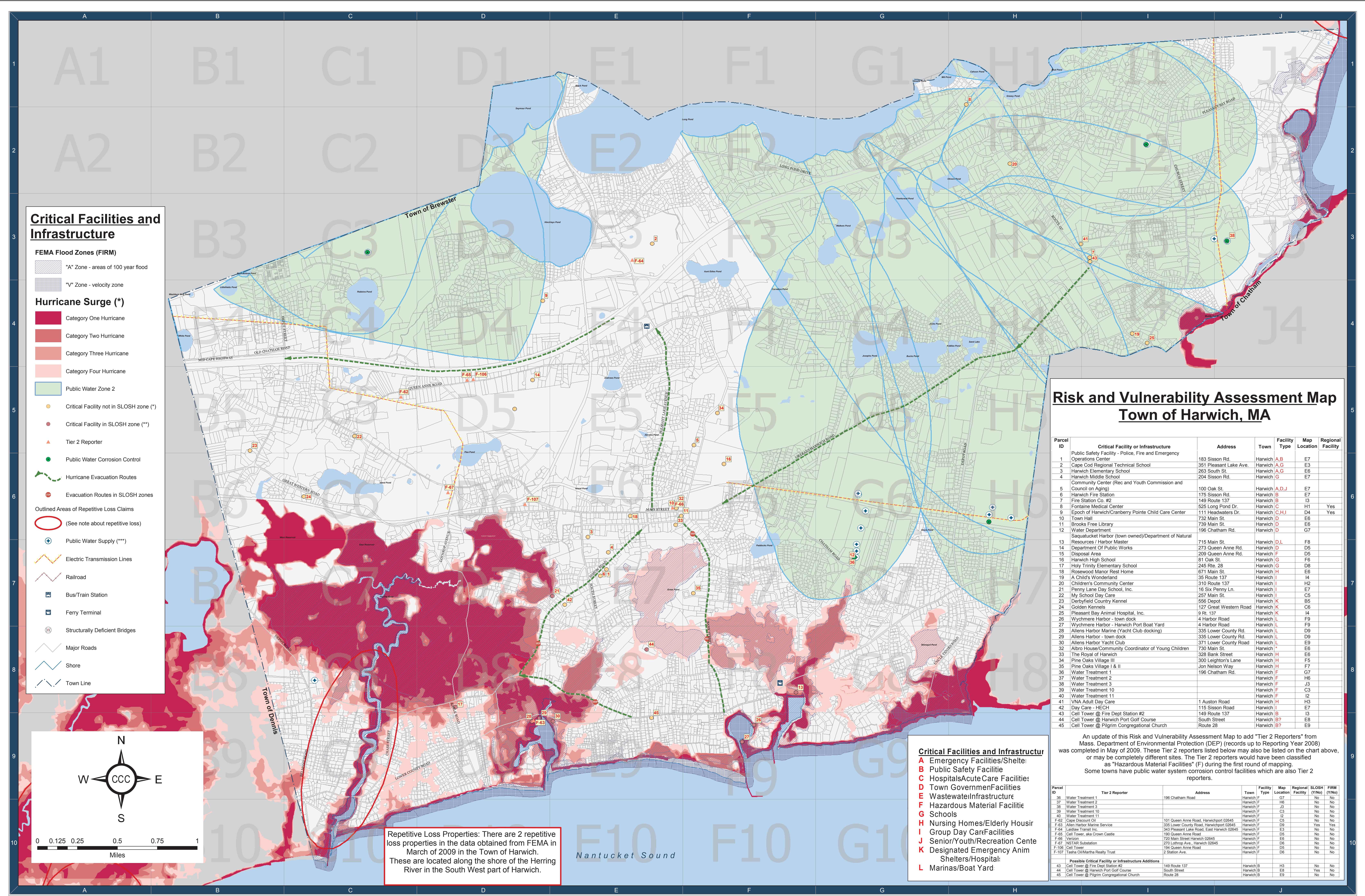
1. The Board of Selectmen and the Town Administrator will receive an annual report and/or presentation on the implementation status of the MHM Plan. This will include at a minimum, a printed version of the Mitigation Action Plan indicating the implementation status of each identified action item.
2. The Report will also include an evaluation of the effectiveness and appropriateness of the actions proposed in the Plan.
3. The Report will recommend any required changes or amendments to the MHM Plan.
4. If an amendment, change, or update (based on Section 6.4 below) is needed the Board of Selectmen shall vote to adopt the change and to amend the MHM Plan.

6.4 Revisions and Updates

Periodic revision and updates may be required to ensure that the hazard mitigation goals, objectives, and activities for Provincetown are kept current. More importantly, revisions may be necessary to ensure the MHM Plan is in full compliance with Federal regulations and state statutes.

Five-year Plan Review – The MHM Plan should be reviewed every five years to determine if there have been any significant changes in Town that would affect the Action Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques, and changes to Federal, State or County legislation are examples of changes that may affect the condition of the MHM Plan.

Disaster Declaration – Following a disaster declaration, this MHM Plan will need to be reviewed to reflect on lessons learned or to address specific circumstances arising out of the disaster.



Data Sources: (Note: not all features listed in legend are present in each town.)

FEMA Flood Hazard Area: Flood Insurance Rate Maps, 1:4800, Federal Emergency Management Agency, 1986. Due to insufficient accuracy of the source maps, areas shown have been digitized and adjusted to match the MassGIS 1:25000 road network by the Cape Cod Commission. Exact flood hazard boundaries may need to be determined by land survey methods as used by FEMA.

Hurricane Surge data: Army Corps of Engineers. Updated areas of inundation based on severity of hurricanes. Completed 10/30/02 using the SLOSH (Sea Lake and Overland Surges from Hurricanes) model. These are areas of inundation modeled to occur from wind and pressure forces of hurricanes.

Critical Facilities in SLOSH Zones include properties where only part of the parcel is within the SLOSH Zone.

Public Water Supply symbol may designate multiple wellheads.

The Critical Facility labels on the map consist of a Parcel ID which corresponds to a table included on the map. The Facility Type can be identified from the key included on the map.

Repetitive loss property: Known to be incomplete, but based upon best available information from FEMA.

Evacuation Route: MEMA. Best available information from Local Comprehensive Emergency Management Plans on file with the Massachusetts Emergency Management Agency.

This map was produced by the Cape Cod Commission Geographic Information System Department for the Pre-Disaster Mitigation Project. The Cape Cod Commission is a division of Barnstable County. This update of the map was completed on June 30, 2011.

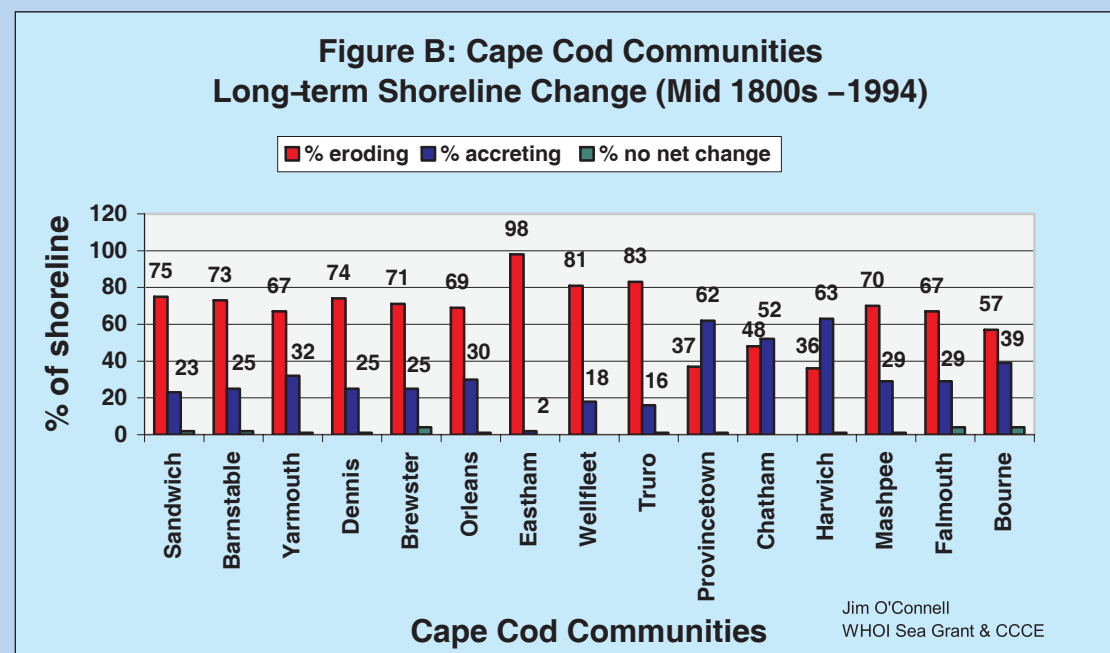
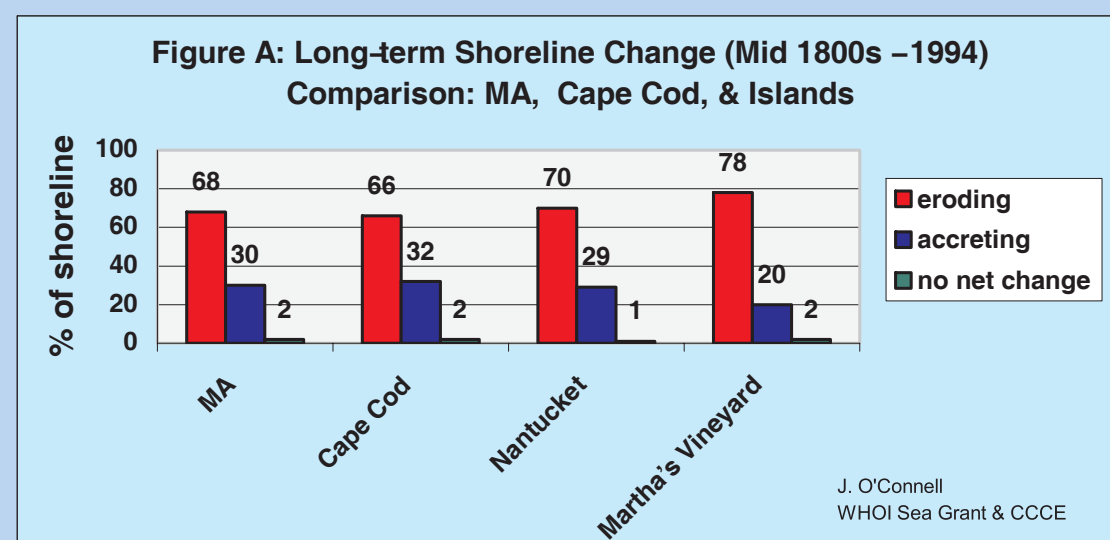
Digital data used are from MassGIS, the Army Corps of Engineers, and the Cape Cod Commission, 2003, and 2011. Data bases associated with critical facilities were researched by AmeriCorps of Cape Cod, 2003, and Barnstable County Department of Health and the Environment, 2007, and The Harwich Planning Department, 2011.

Information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel level analysis.



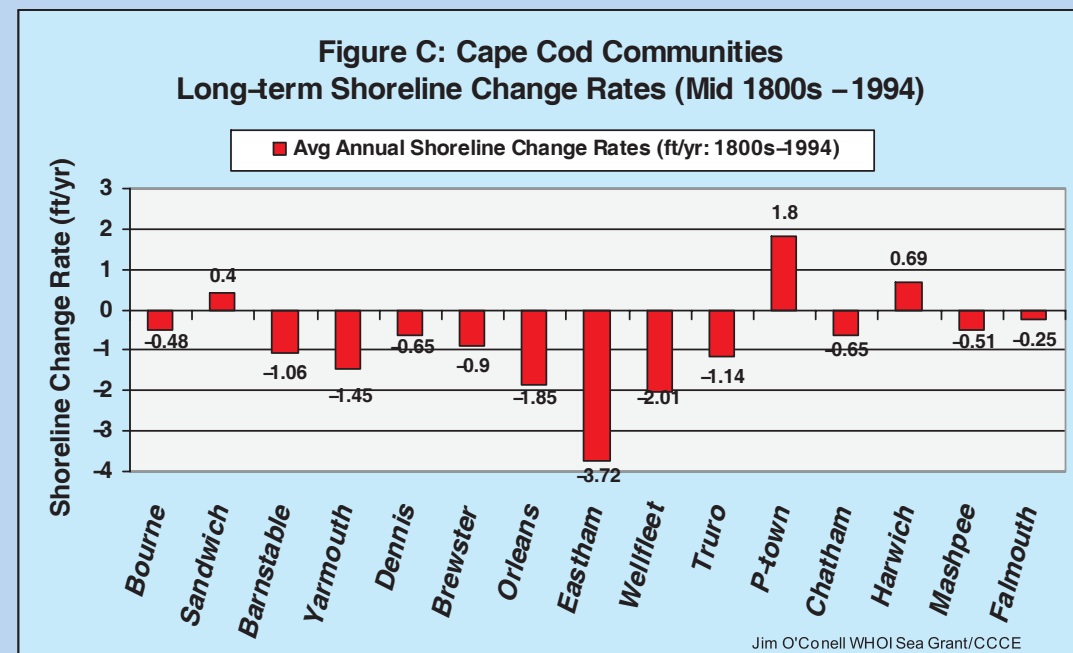
Regional Hazard Risk (Map I), Cape Cod, Massachusetts

- Landslide Susceptibility
- Long –Term Shoreline Change Susceptibility
- Historic Tornado Activity
- Historic Earthquake Activity

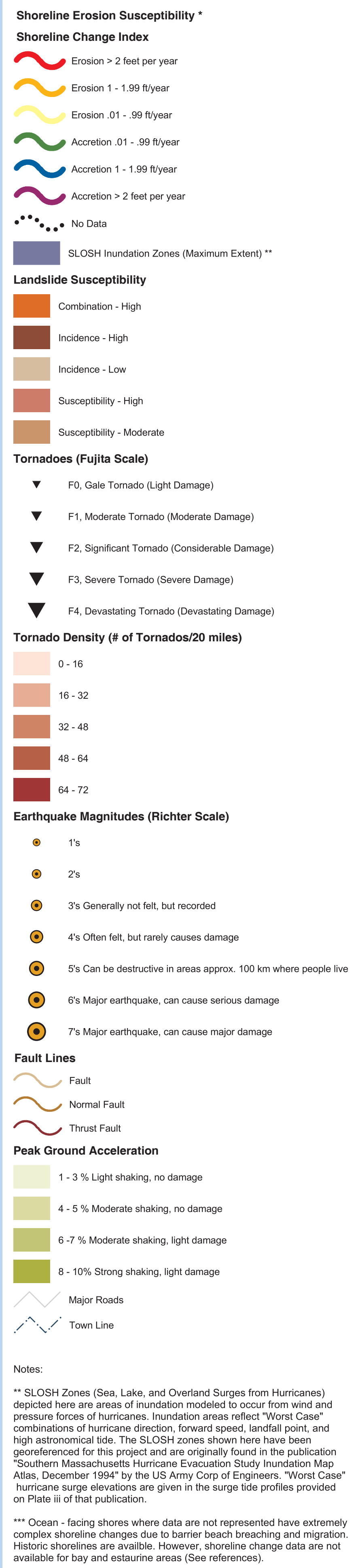


* Cape Cod has 586 miles of tidal shoreline of which 238 miles of primarily ocean-facing shore were analyzed for shoreline change trends (O'Connell, et al., 2002; Thielert et al., 2001). The long-term shoreline change rate for all Cape Cod communities combined is -0.68 ft/yr, slightly higher than the statewide average: -0.65 (157 miles) of the Cape Cod shoreline shows long-term erosion. Twelve of the 15 Cape Cod communities exhibit a long-term erosion trend, while only 3 exhibit long-term accretion.

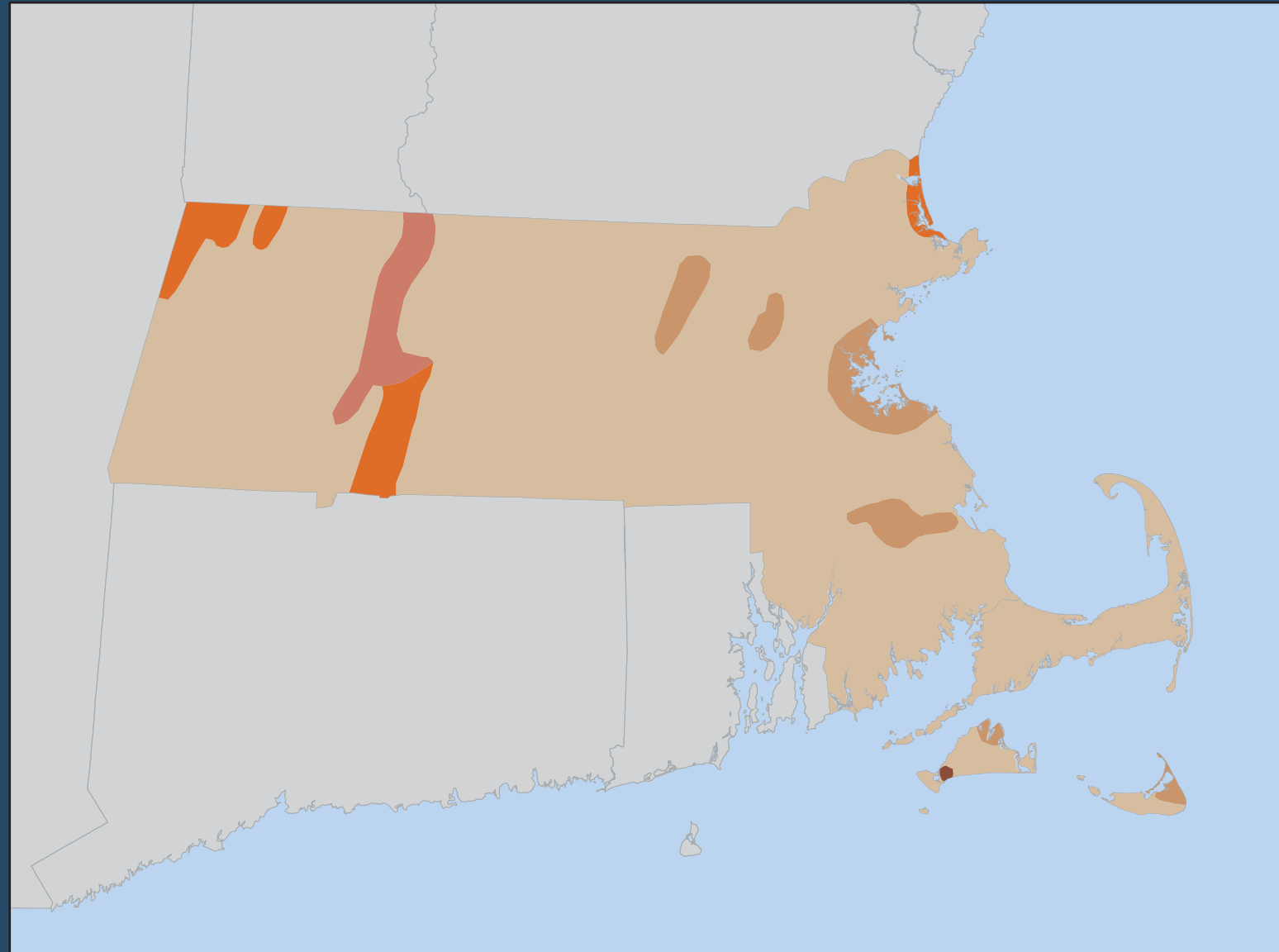
The shoreline change data on this map were generalized from 27 individual shoreline change maps covering Cape Cod. The original data were blocked and averaged in groups exhibiting similar shoreline change trends along the shore. Therefore, there may be small, localized areas that are opposite the shoreline change trend shown on this map. Refer to the original maps and data tables for more detail (Thielert et al., 2002; O'Connell, et al., 2002). Data analysis for this map was conducted by Jim O'Connell, WHOI Sea Grant and Cape Cod Cooperative Extension.



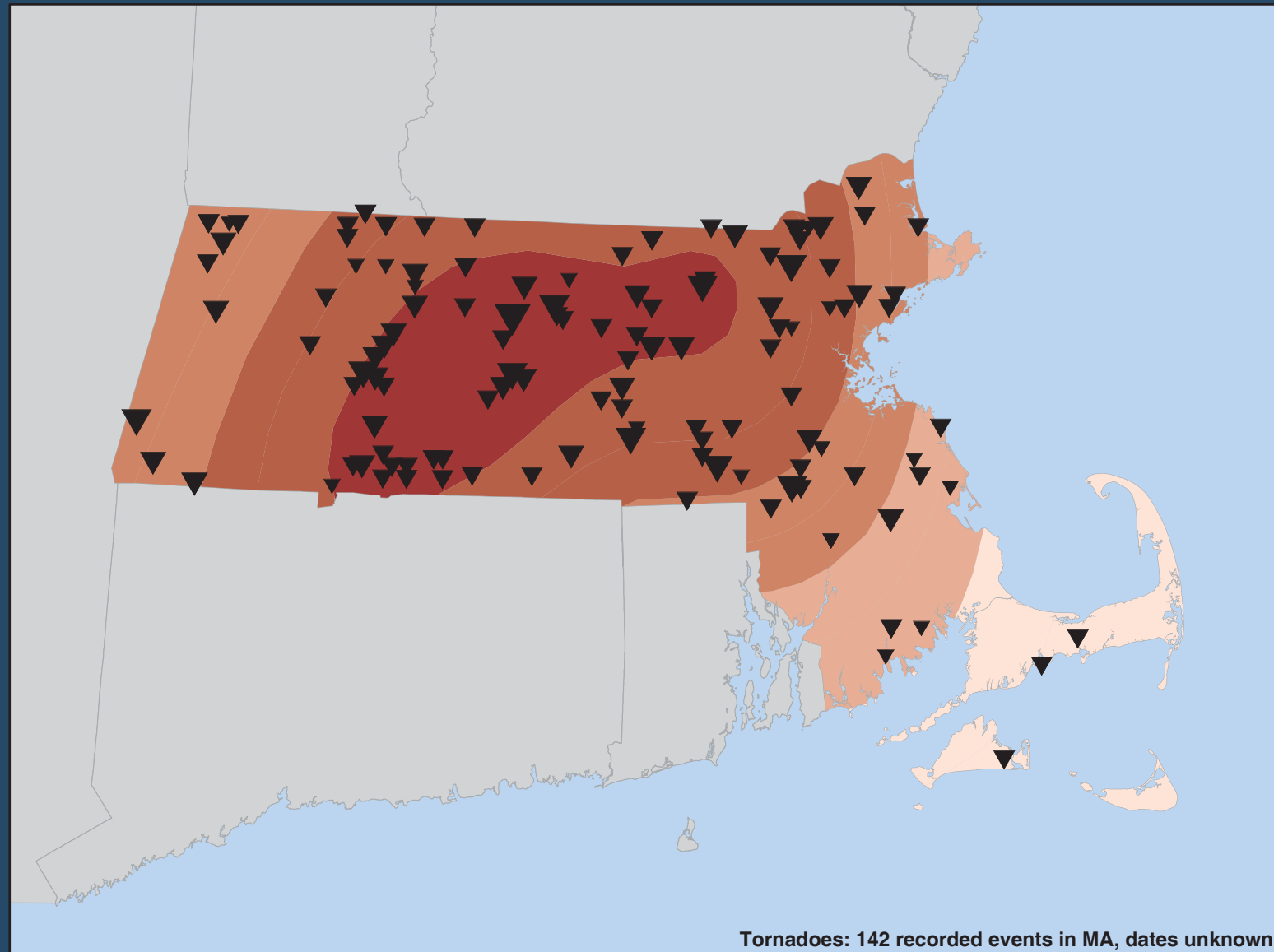
Atlantic Ocean



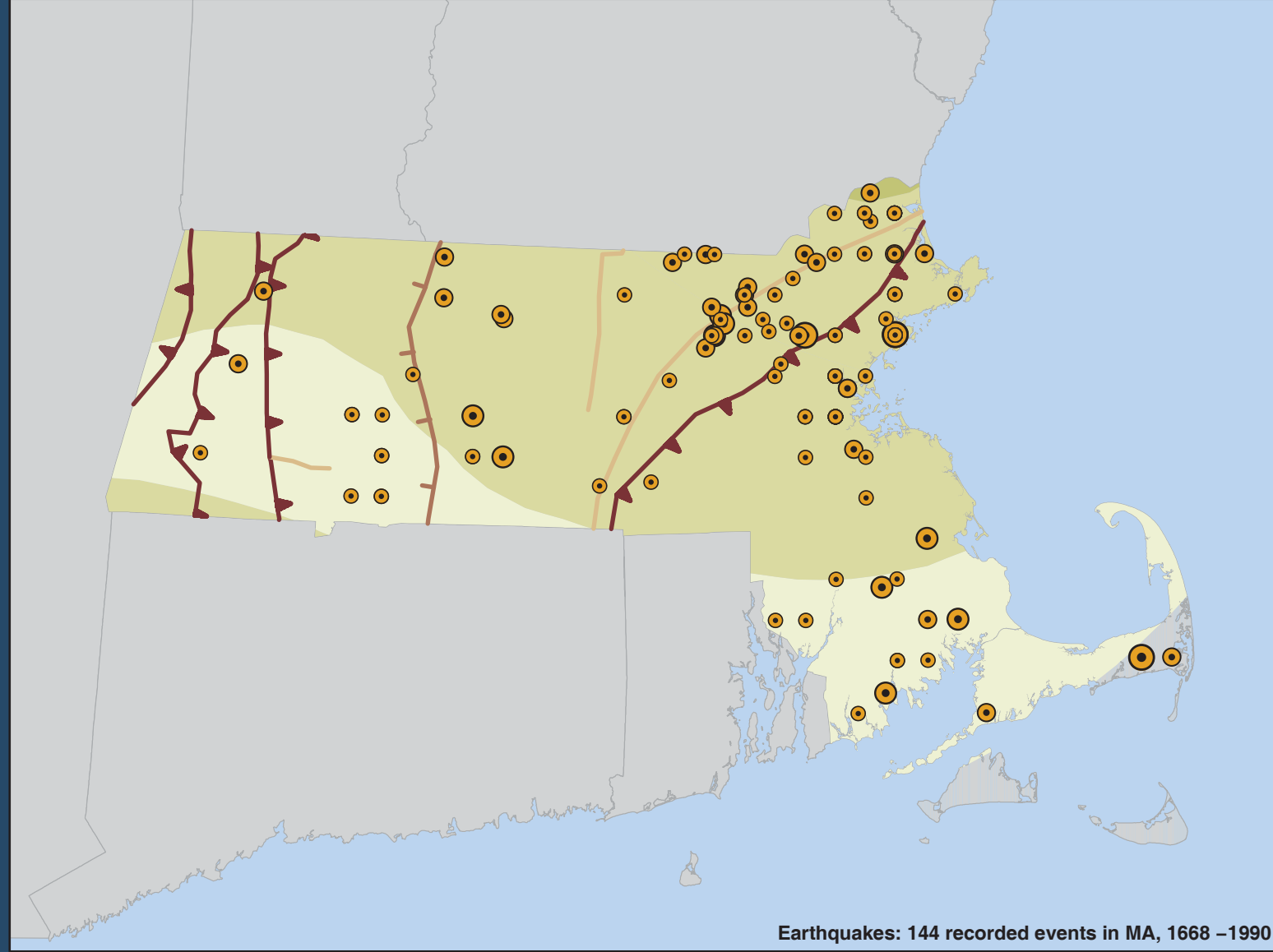
Landslide Susceptibility



Historic Tornado Activity



Historic Earthquake Activity



NOTE and CAUTION: The shoreline change data on this map were generalized from 27 individual shoreline change maps covering Cape Cod. The shoreline change data span approximately 150 years (mid 1800s to 1994), with an uncertainty range of +/- 1.4 feet per year. The original data were blocked and averaged in groups exhibiting similar shoreline change trends along the shore. Therefore, there may be small, localized areas that are opposite the shoreline change trend shown. Furthermore, caution should be used when interpreting any shoreline change data as recent trends in shoreline movement may have changed as a result of natural causes, or importantly, human activities, such as seawall/revetment, piling or groin construction. It is important to analyze the short-term shoreline change data that were used to calculate the long-term rates of change to identify recent changes in shoreline movement that may be more applicable for planning purposes. For case examples, see O'Connell, et al., 2002 & 2003, and Thielert, et al., 2002 listed in the references below. Data tables and maps can be viewed at www.state.ma.us/czm/czm.htm.

Data Sources:

Northeast States Emergency Consortium (NESEC) www.nsec.org; MassGIS Executive Office of Environmental Affairs; "Coastal Erosion on Cape Cod: Some Questions and Answers" (<http://woodshole.er.usgs.gov/staffpages/foia/capecod/>); Federal Emergency Management Agency (FEMA); and the Cape Cod Commission's Geographic Information System Department.

References:

IPCC, 1995, Second Assessment - Climate Change 1995: A Report of the Intergovernmental Panel on Climate Change, IPCC, Geneva, Switzerland.

O'Connell, J.F., 2003, New Shoreline Change Data Reveal Massachusetts is Eroding, WHOI Sea Grant and Cape Cod Cooperative Extension, Marine Extension Bulletin, March, 2003.

O'Connell, J.F., Thielert, E.R., and Schupp, C., 2002, New Shoreline Change Data and Analysis for the Massachusetts Shore, with Emphasis on Cape Cod and the Islands: Mid 1800s - 1994, Environment Cape Cod, Vol. 5, No. 1.

Thielert, E.R., O'Connell, J.F., and Schupp, C., 2002, The Massachusetts Shoreline Change Project: 1800s - 1994, Technical Report, U.S.G.S. Administrative Report, Woods Hole, MA.

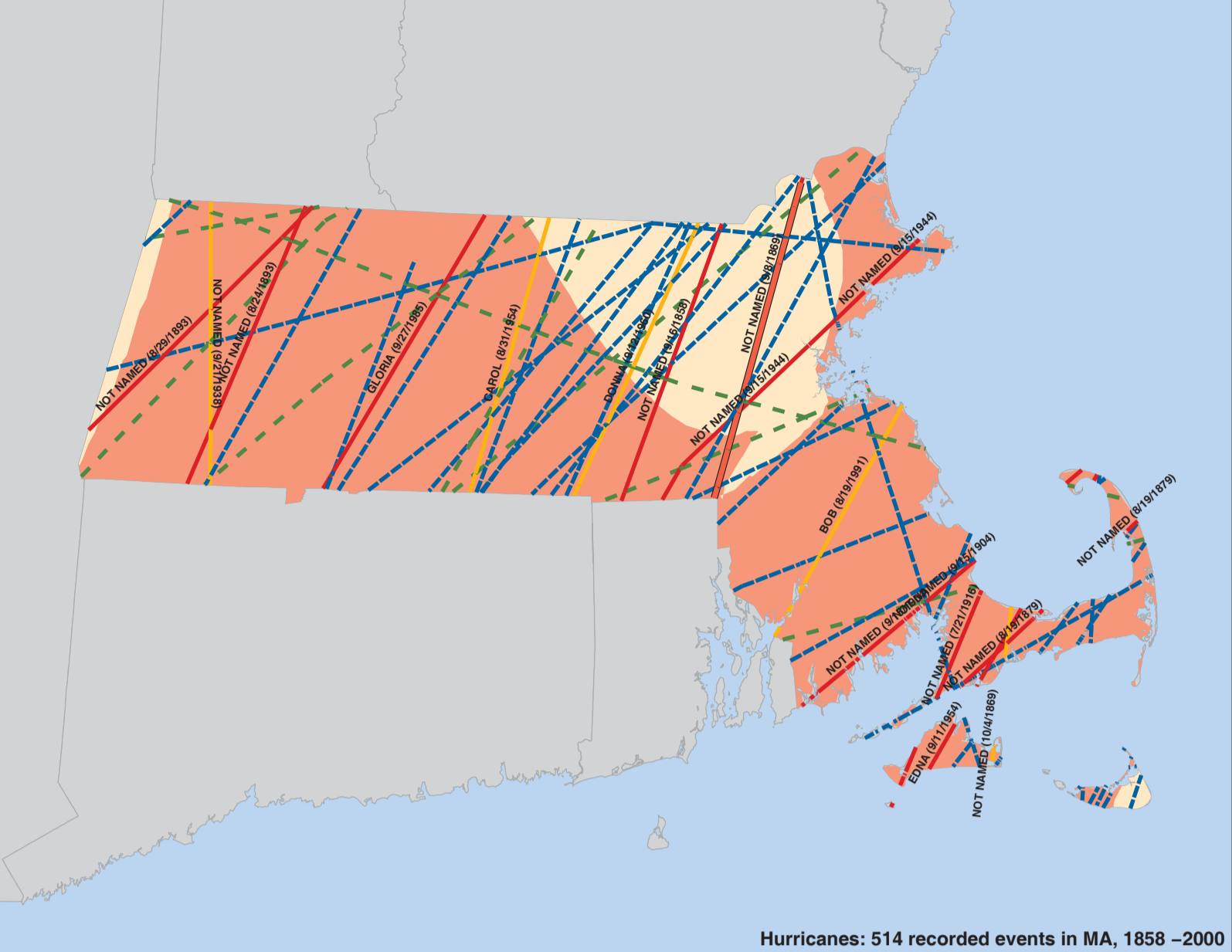
Funding for the Cape Cod Pre-disaster Mitigation Planning grant was provided to the Cape Cod Commission by the Federal Emergency Management Agency under the DMA 200 Initiative through the Massachusetts Emergency Management Agency. This map was produced through the Cape Cod Commission's Geographic Information System Department for the Pre-disaster Mitigation Project, January, 2004, based on data analysis, graphics and text provided by Jim O'Connell, Woods Hole Oceanographic Institution Sea Grant Program and Cape Cod Cooperative Extension. A description of the shoreline change data base analyzed for this project can be found in Thielert, O'Connell and Schupp (2002) - see references above. Comments and corrections are welcome at the Cape Cod Commission office or contact gis@capecodcommission.org. This map is illustrative and all depicted boundaries are approximate.



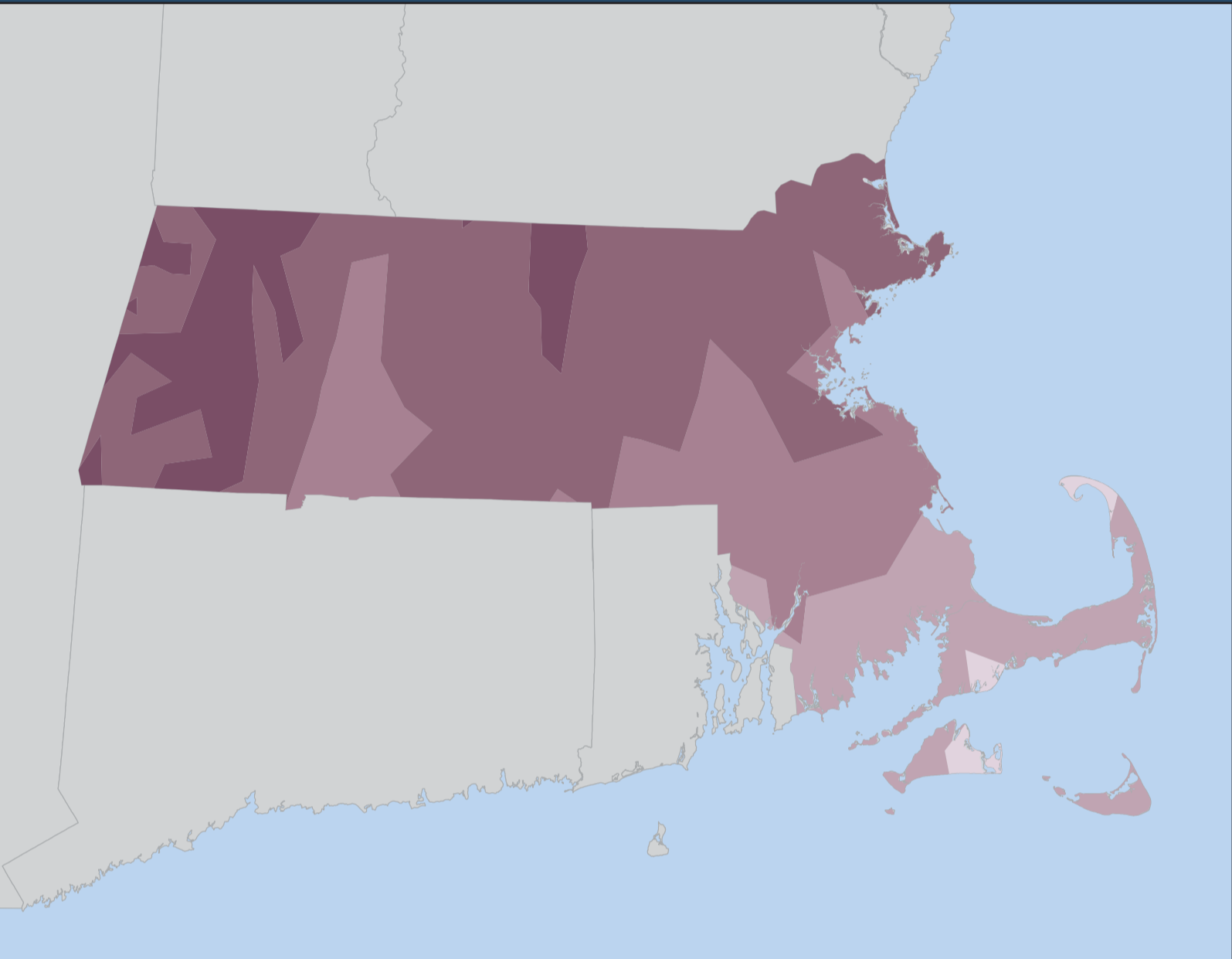
Regional Hazard Risk (Map II), Cape Cod, Massachusetts

- Flood Hazard Areas
- Historic Hurricane Activity and Hurricane Risk
- Historic Average Annual Snowfall

Hurricane Tracks and Hurricane Risk



Average Annual Snowfall



Hurricane Tracks

- Tropical Depression (< 39 MPH Sustained Winds)
- Tropical Storm (39 - 73 MPH Sustained Winds)
- Category 1 Hurricane (74 - 95 MPH Sustained Winds)
- Category 2 Hurricane (96 - 110 MPH Sustained Winds)
- Category 3 Hurricane (111 - 133 MPH Sustained Winds)

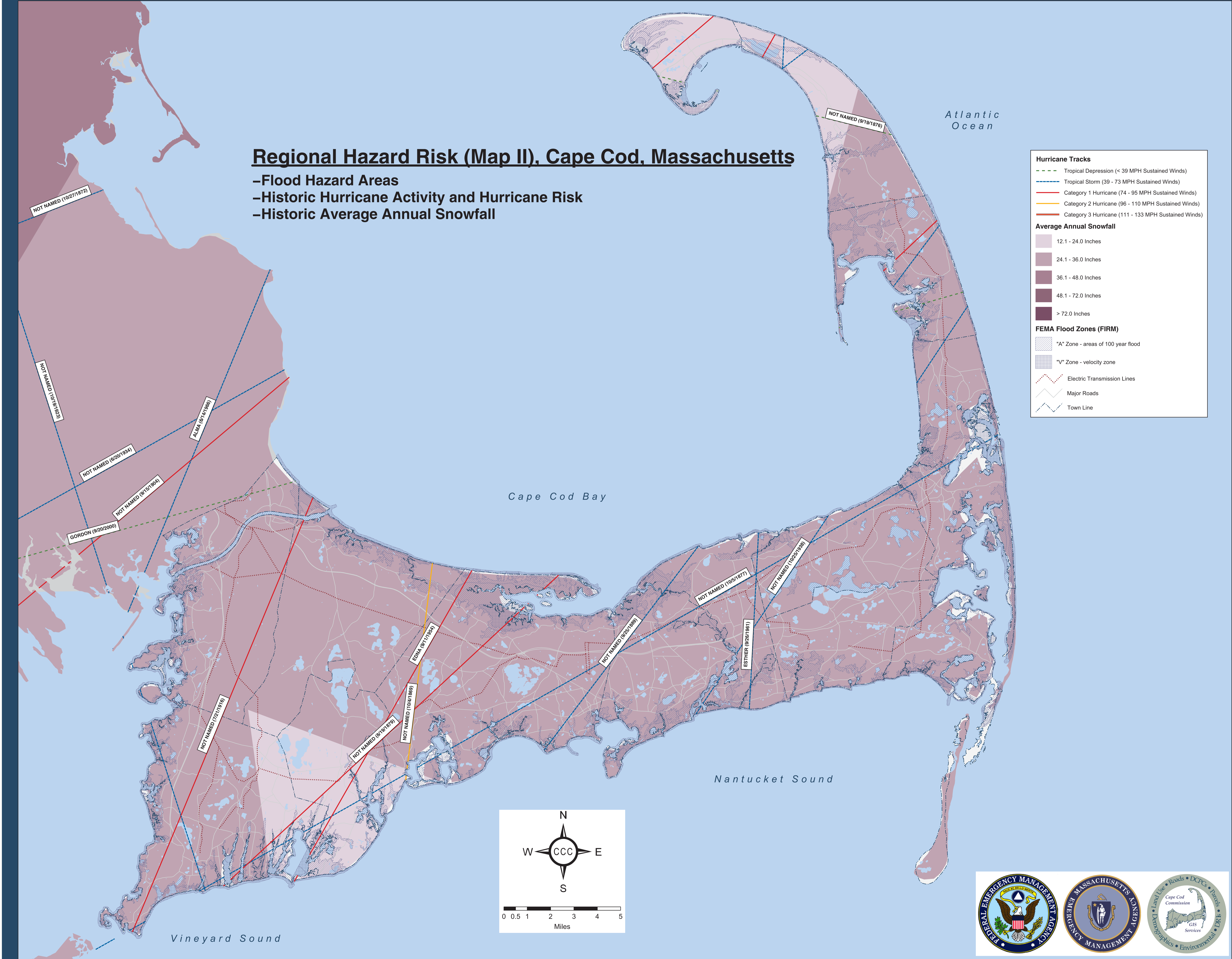
Average Annual Snowfall

- 12.1 - 24.0 Inches
- 24.1 - 36.0 Inches
- 36.1 - 48.0 Inches
- 48.1 - 72.0 Inches
- > 72.0 Inches

FEMA Flood Zones (FIRM)

- *A* Zone - areas of 100 year flood
- *V* Zone - velocity zone
- Electric Transmission Lines
- Major Roads
- Town Line

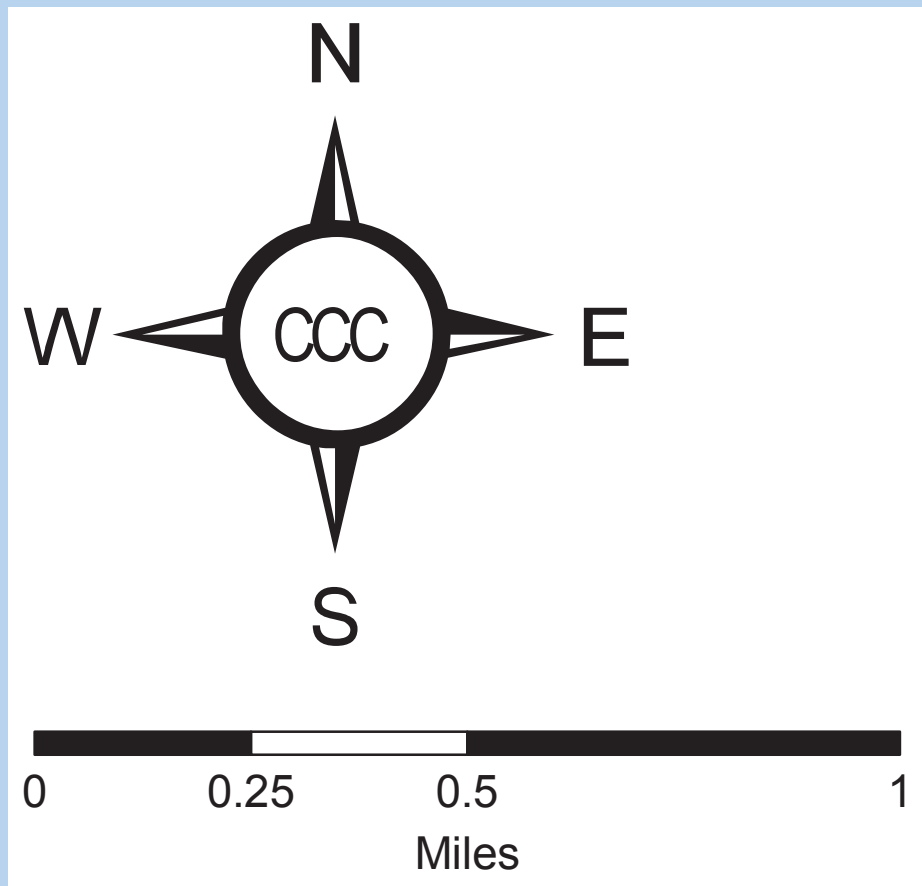
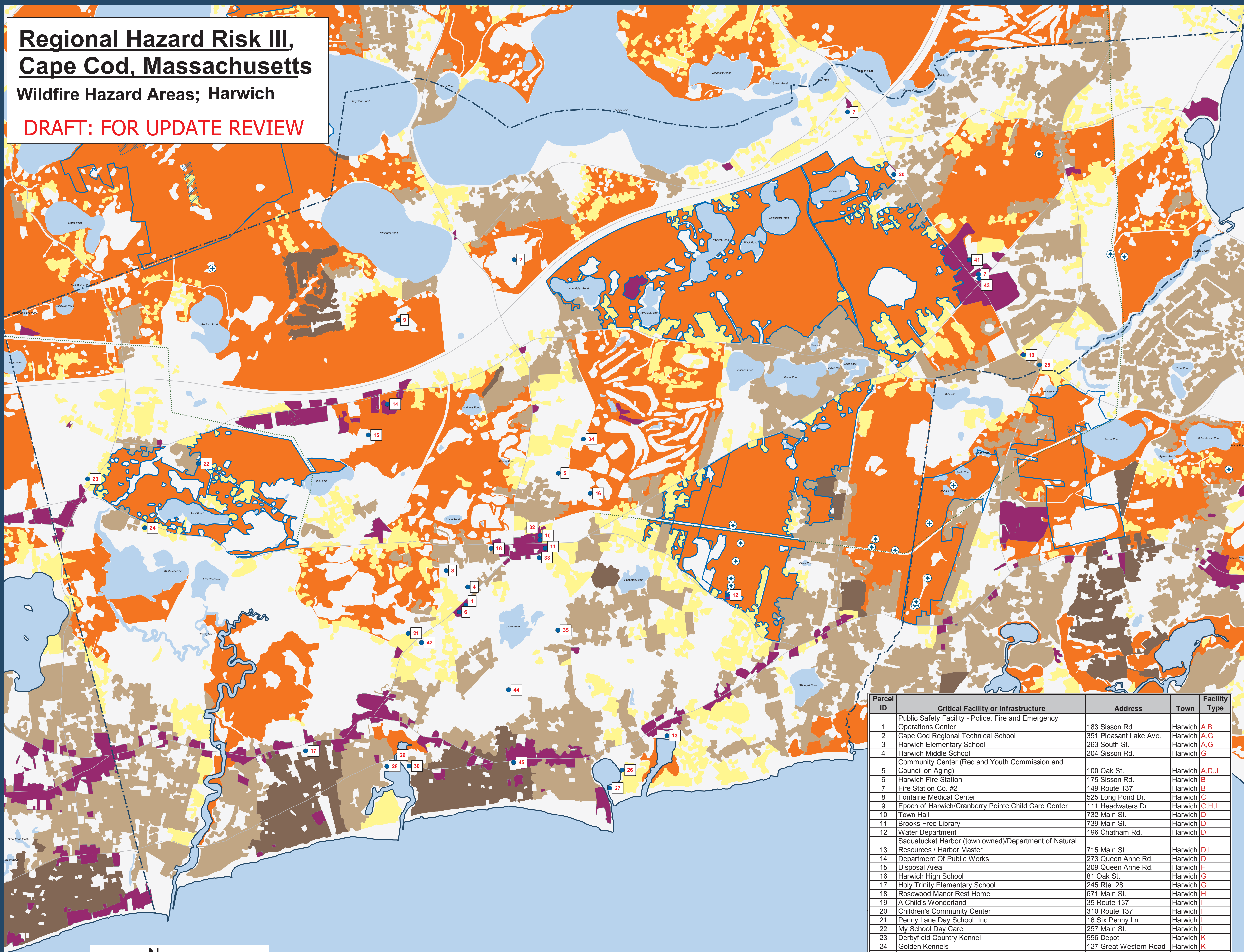
Data Sources:
Northeast States Emergency Consortium (NESEC) www.nesec.org, MassGIS Executive Office of Environmental Affairs, Greg's Weather Center (<http://hometown.aol.com/hurtrack/HurcTrack.index.html>), The United States Hurricane Page (<http://www.geocities.com/hurricane/>), and the Cape Cod Commission's Geographic Information System Department.
Funding for the Cape Cod Pre-Disaster Mitigation Planning grant was provided to the Cape Cod Commission by the Massachusetts Emergency Management Agency. Funding for statewide PDM planning was originally provided by the Federal Emergency Management Agency - Region I under the DMA 2000 Initiative.
This map was produced by the Cape Cod Commissions Geographic Information System Department for the Pre-Disaster Mitigation Project May 30, 2003. Comments and corrections are welcome at the Cape Cod Commission office or contact gis@capecodcommission.org. This map is illustrative and all depicted boundaries are approximate.



**Regional Hazard Risk III,
Cape Cod, Massachusetts**

Wildfire Hazard Areas; Harwich

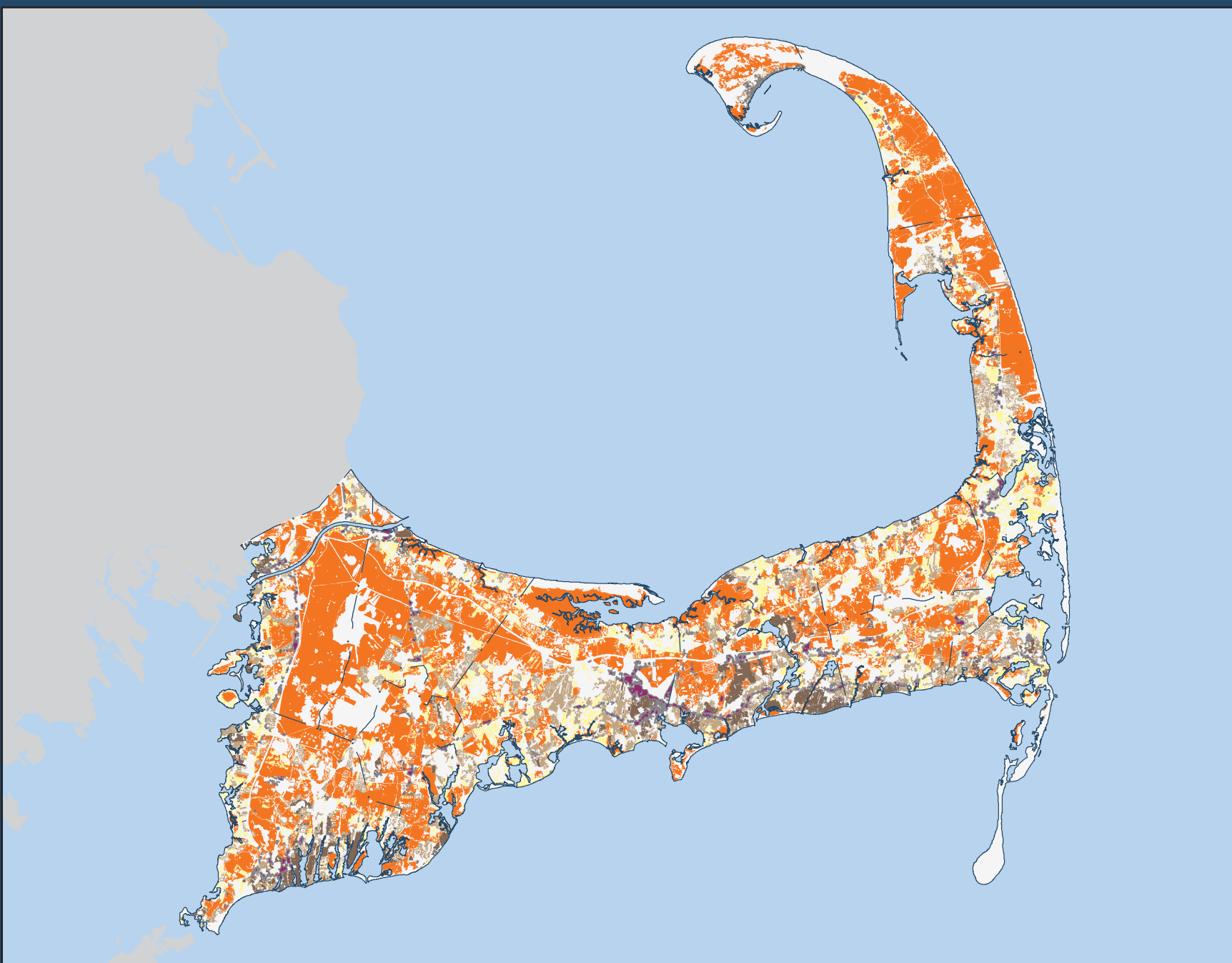
DRAFT: FOR UPDATE REVIEW



- Critical Facilities and Infrastructure**
- A** Emergency Facilities/Shelter
 - B** Public Safety Facility
 - C** Hospitals/Acute Care Facilities
 - D** Town Government Facilities
 - E** Wastewater/Infrastructure
 - F** Hazardous Material Facilities
 - G** Schools
 - H** Nursing Homes/Elderly Housing
 - I** Group Day Care Facilities
 - J** Senior/Youth/Recreation Center
 - K** Designated Emergency Animal Shelters/Hospital
 - L** Marinas/Boat Yard

Parcel ID	Critical Facility or Infrastructure	Address	Town	Facility Type
1	Public Safety Facility - Police, Fire and Emergency Operations Center	183 Sisson Rd.	Harwich	A,B
2	Cape Cod Regional Technical School	351 Pleasant Lake Ave.	Harwich	A,G
3	Harwich Elementary School	263 South St.	Harwich	A,G
4	Harwich Middle School	204 Sisson Rd.	Harwich	G
5	Community Center (Rec and Youth Commission and Council on Aging)	100 Oak St.	Harwich	A,D,J
6	Harwich Fire Station	175 Sisson Rd.	Harwich	B
7	Fire Station Co. #2	149 Route 137	Harwich	B
8	Fontaine Medical Center	525 Long Pond Dr.	Harwich	C
9	Epoch of Harwich/Cranberry Pointe Child Care Center	111 Headwaters Dr.	Harwich	C,H,I
10	Town Hall	732 Main St.	Harwich	D
11	Brooks Free Library	739 Main St.	Harwich	D
12	Water Department	196 Chatham Rd.	Harwich	D
13	Sagittuck Harbor (town owned)/Department of Natural Resources / Harbor Master	715 Main St.	Harwich	D,L
14	Department Of Public Works	273 Queen Anne Rd.	Harwich	D
15	Disposal Area	209 Queen Anne Rd.	Harwich	F
16	Harwich High School	81 Oak St.	Harwich	G
17	Holy Trinity Elementary School	245 Rte. 28	Harwich	G
18	Rosewood Manor Rest Home	671 Main St.	Harwich	H
19	A Child's Wonderland	35 Route 137	Harwich	
20	Children's Community Center	310 Route 137	Harwich	
21	Penny Lane Day School, Inc.	16 Six Penny Ln.	Harwich	
22	My School Day Care	257 Main St.	Harwich	
23	Derbyfield Country Kennel	556 Depot	Harwich	K
24	Golden Kennels	127 Great Western Road	Harwich	K
25	Pleasant Bay Animal Hospital, Inc.	9 Rt. 137	Harwich	K
26	Wychmere Harbor - town dock	4 Harbor Road	Harwich	L
27	Wychmere Harbor - Harwich Port Boat Yard	4 Harbor Road	Harwich	L
28	Allens Harbor Marine (Yacht Club docking)	335 Lower County Rd.	Harwich	L
29	Allens Harbor - town dock	335 Lower County Rd.	Harwich	L
30	Allens Harbor Yacht Club	371 Lower County Road	Harwich	L
32	Albro House/Community Coordinator of Young Children	730 Main St.	Harwich	
33	The Royal of Harwich	328 Bank Street	Harwich	H
34	Pine Oaks Village III	300 Leighton's Lane	Harwich	H
35	Pine Oaks Village I & II	Jon Nelson Way	Harwich	H
36	Water Treatment 1	196 Chatham Rd.	Harwich	F
37	Water Treatment 2		Harwich	F
38	Water Treatment 3		Harwich	F
39	Water Treatment 10		Harwich	F
40	Water Treatment 11		Harwich	F
41	VNA Adult Day Care	1 Auston Road	Harwich	H
42	Day Care - HECH	115 Sisson Road	Harwich	H
43	Cell Tower @ Fire Dept Station #2	149 Route 137	Harwich	B?
44	Cell Tower @ Harwich Port Golf Course	South Street	Harwich	B?
45	Cell Tower @ Pilgrim Congregational Church	Route 28	Harwich	B?

Wildfire Hazard Areas



Wildfire Hazard Areas

Wildfire Risk*

Implied but not shown on this map:

Wildland/Urban Interface**

Residential and Commercial Development

High Density Residential

Medium Density Residential

Low Density Residential

Commercial; Industrial

Mitigation Plan Areas

Non - Town Owned Inholdings

Critical Facilities and Infrastructure

Public Water Supplies

Electric Transmission Lines

Rail Lines

Major Roads

*Wildfire Risk category includes unfragmented forest habitat MacConnell forest category greater than 40 acres and salt marsh areas greater than 3 acres.

**Wildland/Urban Interface includes areas 100 feet adjacent to residential and commercial development, or 50 feet adjacent to electrical transmission line and rail right-of-ways, and major transportation infrastructure that may represent an elevated risk.

Data Sources:

MacConnell landuse: (digital) MassGIS, 2005.

Northeast States Emergency Consortium (NESEC) www.nesec.org, MassGIS Executive Office of Environmental Affairs, Federal Emergency Management Agency (FEMA), Cape Cod Brush Breakers Pictorial History (<http://www.capecodfd.com/PAGES%20Special/Breakers00.htm>), USDA Forest Service (<http://www.fs.fed.us/na/durham/>), and the Cape Cod Commission's Geographic Information System Department. Additional appreciation to Jeffrey Stanovich, Forest Fire Patrolman, Plymouth County, MA for his thoughtful input.

Funding for the Cape Cod Pre-Disaster Mitigation Planning grant was provided to the Cape Cod Commission by the Massachusetts Emergency Management Agency. Funding for statewide PDM planning was originally provided by the Federal Emergency Management Agency - Region I under the DMA 2000 Initiative.

This map was produced by the Cape Cod Commissions Geographic Information System Department for the Pre-Disaster Mitigation Project May 30, 2003. It was updated for the Cape Cod Regional Multi Hazard Mitigation Project of 2009, then again in July 2011 for the Town of Harwich. Comments and corrections are welcome at the Cape Cod Commission office. This map is illustrative and all depicted boundaries are approximate.



[illegible]