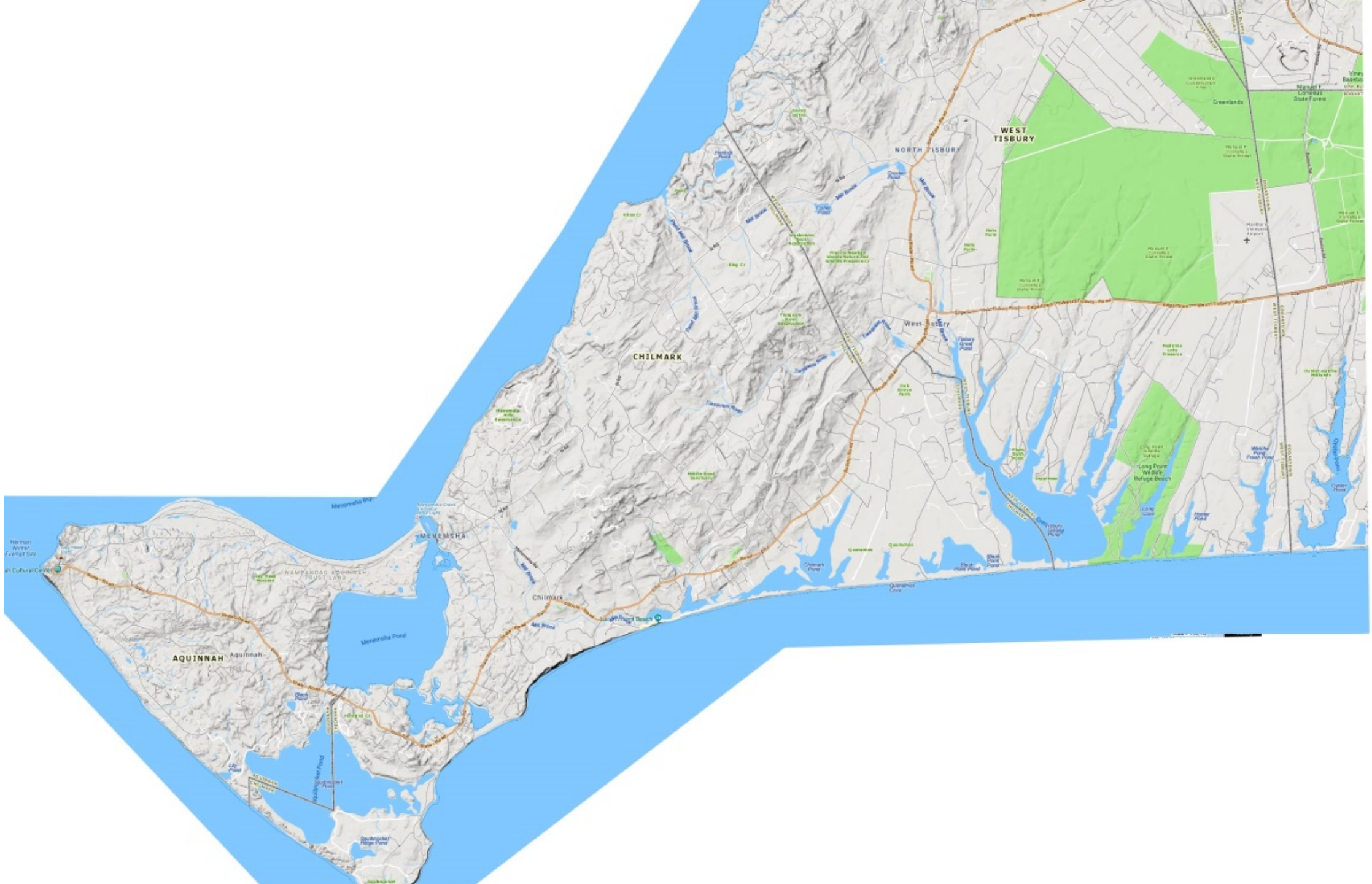
The MVP Process in Chilmark and West Tisbury


WEST TISBURY
NORTH TISBURY
CHILMARK
MENEMSHA
AQUINNAH
Aquinnah
Chilmark
Menemsha Pond
Greenlands
Long Point Wildlife Refuge Beach
Lucy Vincent Beach


WEST TISBURY
OAK BLUFFS
EDGARTOWN
CHILMARK
CHILMARK
CHILMARK
AQUINNAH


LITTLE LADY

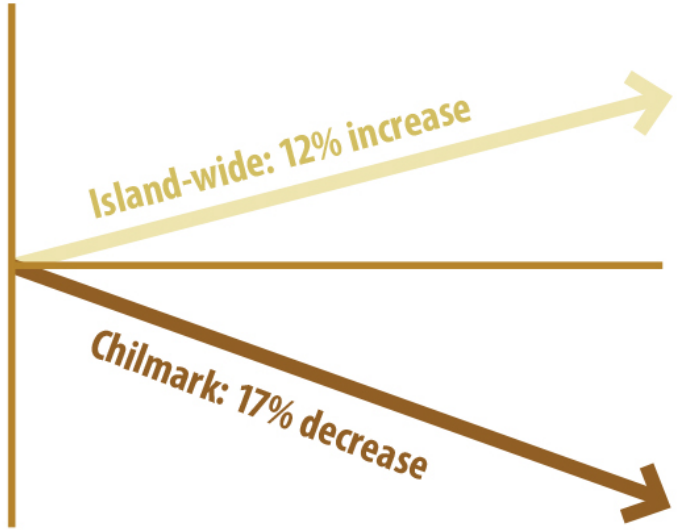
WHO LIVES IN CHILMARK?

CHILMARK HAS A SMALL YEAR-ROUND POPULATION

5% of the year-round population of Martha's Vineyard (905 residents)

THE YEAR-ROUND POPULATION MAY SIGNIFICANTLY DECREASE

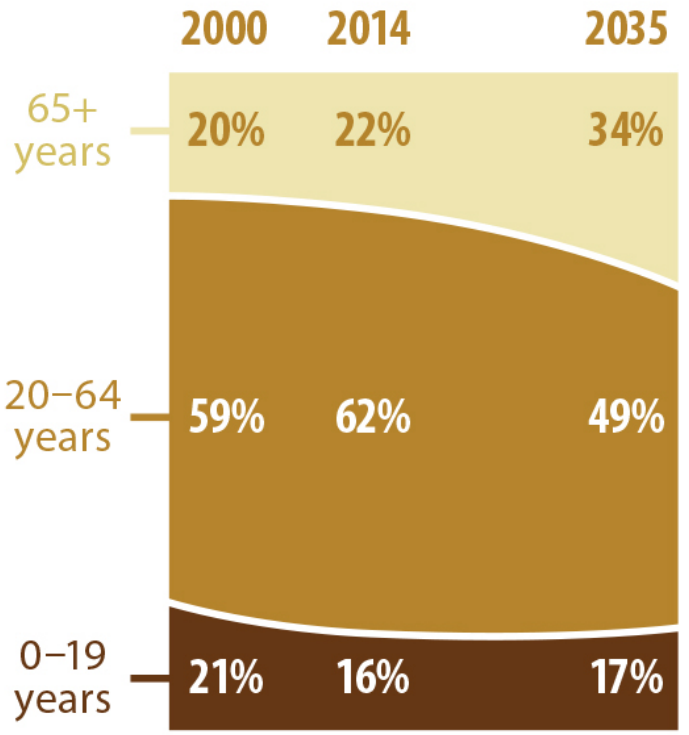
PROJECTED YEAR-ROUND POPULATION FROM 2010 TO 2035:



Chilmarks's year-round population is expected to drop from 866 in 2010 to 718 in 2035.

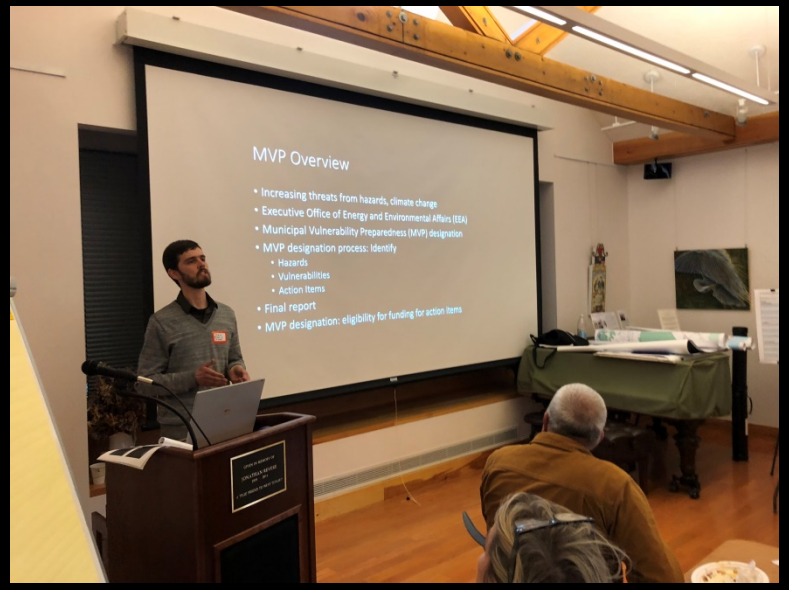
Source: 2010 US Census and UMass Donahue Institute Population Projections

FEWER WORKING-AGE ADULTS AND MORE OLDER ADULTS BY 2035



Source: 2000 US Census, 2010-2014 ACS, and UMass Donahue Institute Population Projections

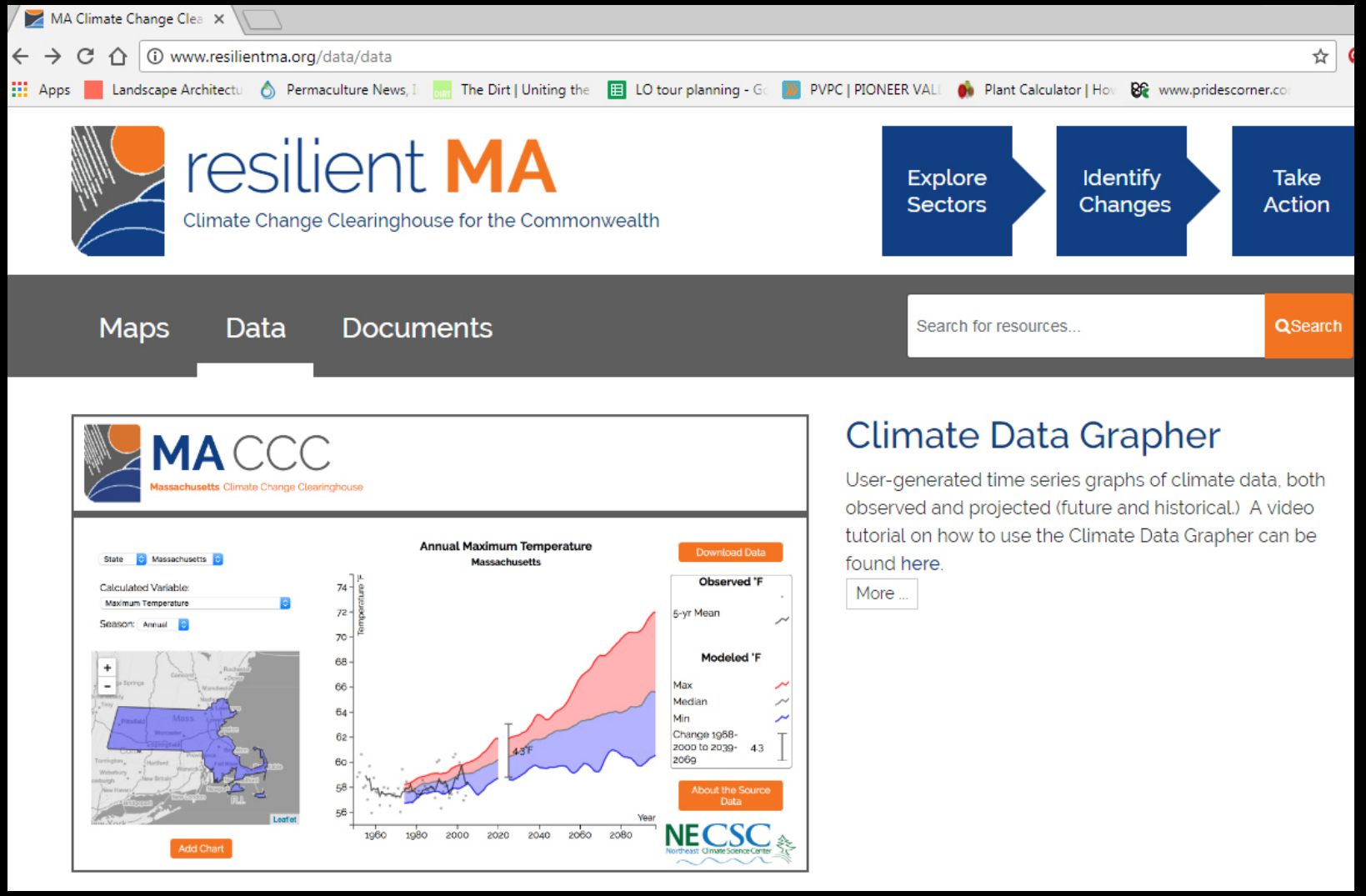
Workshop 1: Hazards and Vulnerabilities



Workshop 1: Hazards and Vulnerabilities

- Sea level rise
- Flooding and wind from hurricanes and nor’easters
- Ecosystem change resulting in increased vector borne diseases (such as Lyme)
- Wildfire
- Drought

Statewide Climate Change Data



resilient MA

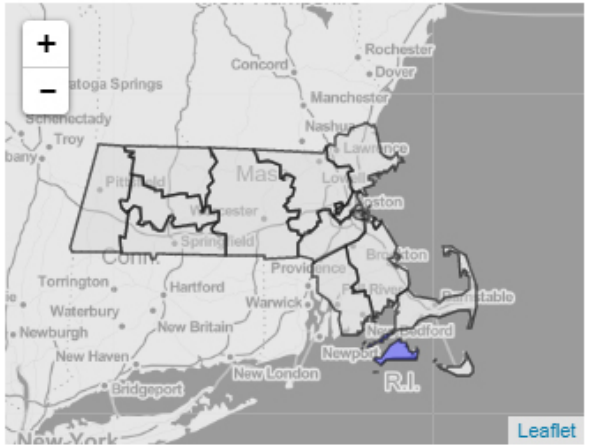
Find maps, data products, reports, articles... Search

County ▾ Dukes County, MA ▾

Calculated Variable:

Days with Maximum Temperature Above 90°F ▾

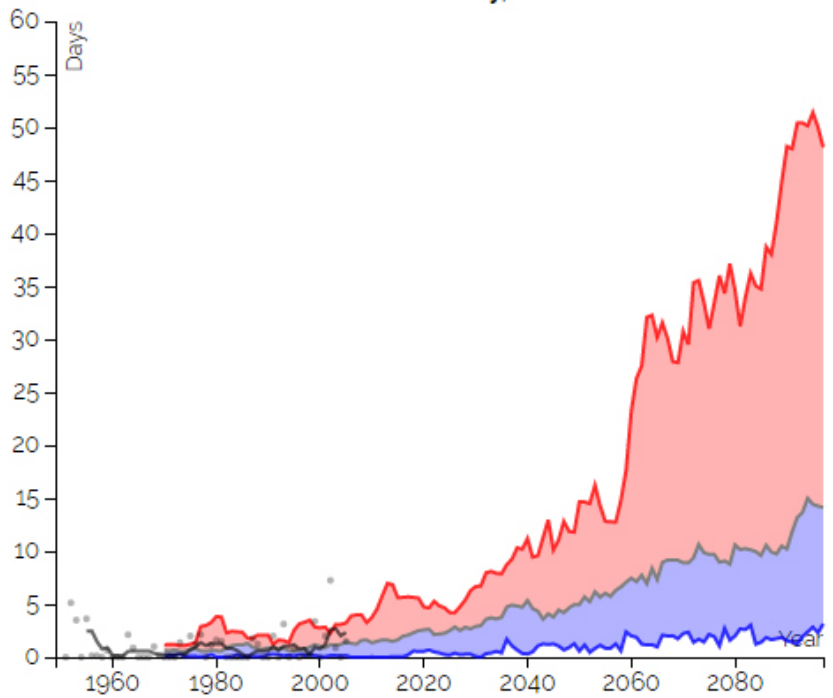
Season: Annual ▾



Add Chart

Annual Days with Maximum Temperature Above 90°F

Dukes County, MA



Download Data

Observed

days

5-yr Mean

Modeled days

Max

Median

Min

Changes from 1971-2000 for:

2020 - 2049	3.48 days
2040 - 2069	5.70 days
2060 - 2089	9.09 days
2080 - 2097	10.34 days

About the Source Data

NECSC Northeast Climate Science Center

Expected in MA by mid-21stCentury

**Relative to the 1971-2000 average*

- Mean annual temp 2.8-6.2°F warmer
- 7-26 more days per year over 90°F
- 19-40 fewer days below 32°F (a decline of 13-27%)
- Total heating degree-days 11-24% lower
- Cooling degree-days 57-150% higher
- Growing degree-days 23-52% higher, and longer growing season

Expected in Dukes County by mid-21stCentury

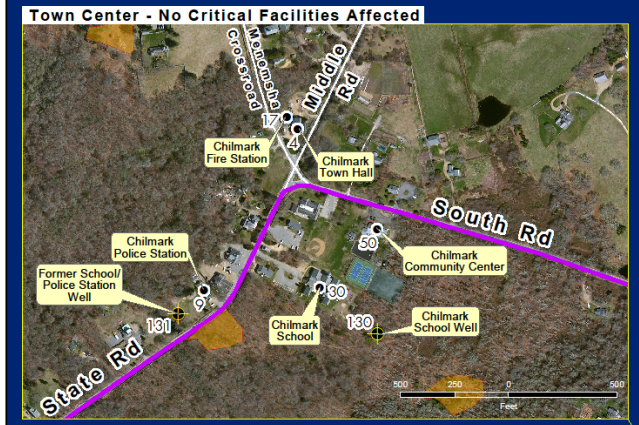
**Relative to the 1971-2000 average*

- Mean annual temp 2-5°F warmer
- 4-15 more days per year over 90°F

Wildland Urban Interface

Chilmark, MA

Pre-Disaster Mitigation Plan



Contiguous Woodlands
- area >=50 acres
- 1000ft Buffer Area

Vegetation
- Pitch Pine or Shrub Oak

- Affected Structures
- Bridges
- Critical Road Segment

Critical Facilities
- Affected
- Affected Public Well
- Not Affected
- Not Affected Public Well

Roads
- Primary Road
- Secondary Road
- Tertiary Road
- Fire Lane

Town Boundary

Affected Critical Facilities

MVC ID	Site Name	Site Category	Inside Buffer or Pitch Pine
18	Chilmark Fire Department - North Rd	Fire Department	Buffer
120	Chilmark DPW Equipment	Public Works Equipment Storage	Buffer
129	Chilmark Spring Water	PW	Buffer

NOTES:
This map was produced by the Martha's Vineyard Commission for the Pre-Disaster Mitigation Project of 2013.
Funding for the Pre-Disaster Mitigation Planning Grant was provided by the Massachusetts Emergency Management Agency.

Woodlands habitat was identified from the 2005 land use data from MassGIS. Non-forest land uses were buffered 250ft and the forest area that did not overlap the non-forest plus 250ft was retained. Those contiguous forest areas of 50 acres or more are represented in this data layer.

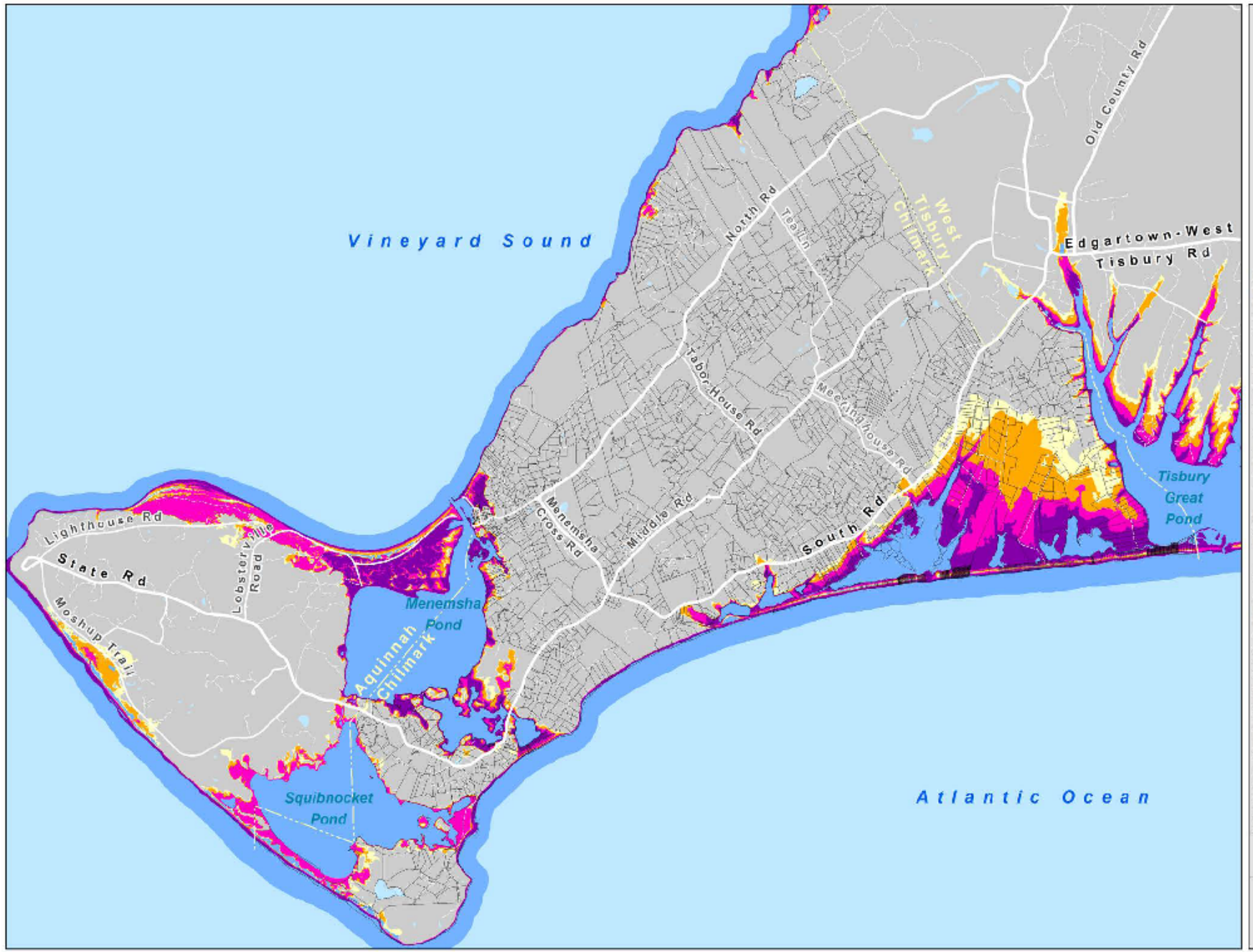
A structure is considered within the wildlife threat area if it is within a contiguous 50 acre woodland area or within its 1000ft buffer area or within the existing pitch pine/shrub oak area.

DISCLAIMER:
Data provided are for planning purposes only. The data are not adequate for boundary determination or regulatory interpretation. The MVC cannot be responsible for how these data are used or interpreted by the end user.

Compiled By: Martha's Vineyard Commission, CL Seidel, 8/28/13, ph. 508-693-3453, www.mvcommission.org
Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastructure - MEMA 2006 & MVC 2013; Woodlands - MassGIS 2005 & MVC 2013; Vegetation - TNC 2005; Structures - MassGIS 2011 (released 2013) & MVC 2013; Fire Lane - MVC 2003
Projection: Stateplane, MA Mainland, NAD83, Meters
File: ck_pdm; Ch_WildFire_2013.mxd - Original in color

0.5 0.25 0 0.5 1
Kilometers
0.25 0.125 0 0.25 0.5
Miles
N

MARTHA'S VINEYARD COMMISSION
MASSGIS



Hurricane Surge Inundation Chilmark, MA

Hurricane Surge Inundation (Flooding)
Worst Case Scenario
- Category 1
- Category 2
- Category 3
- Category 4

FEMA 'Preliminary' Flood Zones
Become 'Effective' July 20, 2016
- 100 Year Flood Zone

Parcel Boundary

Per US Army Corps of Engineers:
Hurricane surge elevations were determined by the National Hurricane Center using the PV2 SLOSH model basin, and assumed peak hurrican surge arriving at mean high water.

The Hurricane surge inundation areas shown on this map depict the inundation that can be expected to result from a worst case combination of hurricane landfall location, forward speed, and direction for each hurricane category.

The primary elevation data source was LiDAR data collected from Nov 2009 to Feb 2010 by Camp Dresser and McKee. This data was supplimented w th MassGIS Digital Terrain Model (DTM) files which were made available in April 2013.

Elevation Accuracy:
SLOSH Model Elevation Data: +/- 20 percent
LiDAR Elevation Data: +/- 0.5ft vertical; +/- 1ft horiz.

100 Year Flood Zone:
The 100 year floor areas represent a subset of the data available on the paper Flood Insurance Rate Maps -FIRM as provided by the Federal Emergency Management Agency (FEMA). These data were do not replace the official paper FIRMs. The data should only be used to portray zones of uncertainty and possible risks associated with flooding not for engineering or site work.

DISCLAIMER:
Data provided are for planning purposes only. These data should not be considered an absolute representation indicating which areas can expect to be flooded by hurricane storm surge for a particular category. The MVC cannot be responsible for how these data are used or interpreted by the end user.

Compiled by: Martha's Vineyard Commission, GLSchol, 3/27/18, ph. 508-693-3453, www.mvcommission.org
Data: Flood Boundaries - FEMA 2013; Roads - MassDOT/MassGIS 2014; Aerial Photo - MassGIS/USGS 2014; Inundation Areas - USACE 2013; Parcels - Cartographic Assoc. 2012
Projection: Stateplane, MA Mainland, NAD83, m
File: ds_hsake_chi_Hurr_Inundation_pa.mxd - Original in color

0.5 0.25 0 0.5 1 Miles

N

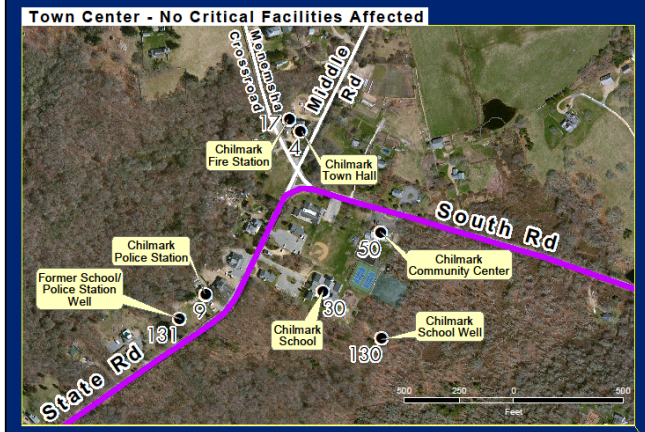
Sea Level Rise Projection

based on 2010 LiDAR elevation data & accounting for MHHW

Chilmark, MA

Pre-Disaster Mitigation Plan

Sea Level Rise Scenarios: 1.5ft and 5ft
Mean High High Water Present Average Offset from NAVD88 Datum = +1.0ft



- Affected Structures
- Bridges
- Dams
  - Low to Moderate Hazard
- Critical Facilities
  - Affected
  - Not Affected
- Sea Level Rise
  plus Mean High High Water Offset
  - <= 2.5ft
  - >2.5ft to 6.0ft
- Roads
  - Primary Road
  - Secondary Road
  - Tertiary Road
  - Critical Road Segment
- Town Boundary

A datum is a reference from which measurements are made. The datum indicates where zero is. For example, the top of a tree may be 30ft high from the ground but that same treetop is only 10ft high from the top of the neighboring rooftop.

NOTES:
This map was produced by the Martha's Vineyard Commission for the Pre-Disaster Mitigation Project of June 2013. Funding for the Pre-Disaster Mitigation Planning Grant was provided by the Massachusetts Emergency Management Agency.

In 2010, LiDAR (Light Detection and Ranging) terrain data was collected along the coast of Martha's Vineyard and the Elizabeth Islands on behalf of FEMA. The data was processed by MassGIS into digital elevation models in geoTiff format. The elevation points, collected at 3ft spacing and two decimal point precision have a vertical accuracy of 0.47ft. The data exceed the required 1.19ft accuracy for 2ft contour generation.

The average offset between the MHHW tidal datum and the NAVD88 datum was calculated for the Island by the MVC. Values were reported by NOAA (online at their Tides & Currents page) for three Island tidal benchmarks: Menemsha, Vineyard Haven Harbor, and Edgartown Harbor. Based on those three sites, on average, MHHW is 1.00ft greater than NAVD88.

To account for this MHHW to NAVD88 offset, the MVC added an additional 1 foot to the sea level rise scenarios.

DISCLAIMER:
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Compiled By: Martha's Vineyard Commission, CL Seidel, 11/25/13, ph. 508-693-3453, www.mvcommission.org
Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastructure - MEMA 2006 and MVC 2013; LiDAR Elevation Data - FEMA 2010 & MassGIS 2012; Aerial Photo - 2011 DigitalGlobe All Rights Reserved; Structures - MassGIS 2013 release from 2011 aerial photos
Projection: Stateplane, MA Mainland, NAD83, Meters
File: cls_pdm; Chi_SeaLevel_MHHW_2013.mxd - Original in color

0.5 0.25 0 0.5 1 Kilometers

0.25 0.125 0 0.25 0.5 Miles

N

Critical Facilities - None Within Projected Sea Level Rise Scenarios

MVCID	SITE_NAME	CATEGORY
4	Chilmark Town Hall	Primary Emergency Operations Center
4	Chilmark Town Hall	Town Hall
9	Chilmark Police Station	MassCare Center
9	Chilmark Police Station	Alternate Emergency Operations Center
9	Chilmark Police Station	Police Station
17	Chilmark Fire Department	Fire Department
18	Chilmark Fire Department - North Rd	Fire Department
30	Chilmark Elementary	School
50	Chilmark Community Center	MassCare Center
104	Menemsha Well	Public Well
115	Chilmark Harbor Master	Harbor Master Office
120	Chilmark DPW Equipment	Public Works Equipment Storage
129	Chilmark Spring Water	PW
130	Chilmark School Well	PW
131	Menemsha School Well	PW

MARTHA'S VINEYARD COMMISSION

MASS GIS

Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

- Identified vulnerable residents, Chilmark:
  - Wildfire
    - About 2000 people within risk area (during summer)
  - Storm Surge
    - About 280 people within SLOSH category 4 (during summer)
  - Flooding
    - 220 people within 100 yr flood (during summer)
  - Sea Level Rise
    - 34 people within 5' SLR

Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

- Identified vulnerable facilities, Chilmark:
  - Wildfire
    - Daycare Center (1)
    - Fire Department (1)
    - Schools (3)
    - Mill Brook Bridge
    - Transmission lines
  - Flooding and Storm Surge
    - Parts of South Rd/State Rd
    - Hariph's Bridge

Massachusetts Sea Level Rise and Coastal Flooding Viewer

Interactive maps of coastal flooding areas and community facilities and infrastructure based on: sea level rise scenarios, Federal Emergency Management Agency coastal flood zones, and hurricane surge models.

Intro | Sea Level Rise | FEMA Coastal Flood Zones | Hurricane Surge

This map includes four worst-case scenarios of storm surge based on thousands of modeled combinations of hurricane intensity (Category 1-4), forward speed, track or direction, and other factors not including sea level rise. The National Oceanic and Atmospheric Administration (NOAA) National Hurricane Center, in partnership with the U.S. Army Corps of Engineers (USACE), uses the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model to calculate the storm surge heights and map coastal areas with the highest degree of exposure.

Zoom in until the hurricane surge scenarios come into view. Community facilities and infrastructure are identified with an icon and facility outline. Click the icon for a pop-up box displaying the facility name, type, town or city, and the water level associated with the hurricane surge scenarios. Flood levels represent water depth in feet above 0 NAVD 88, rather than above the ground surface. Coastal flood data can be directly compared for each facility by switching viewer tabs.

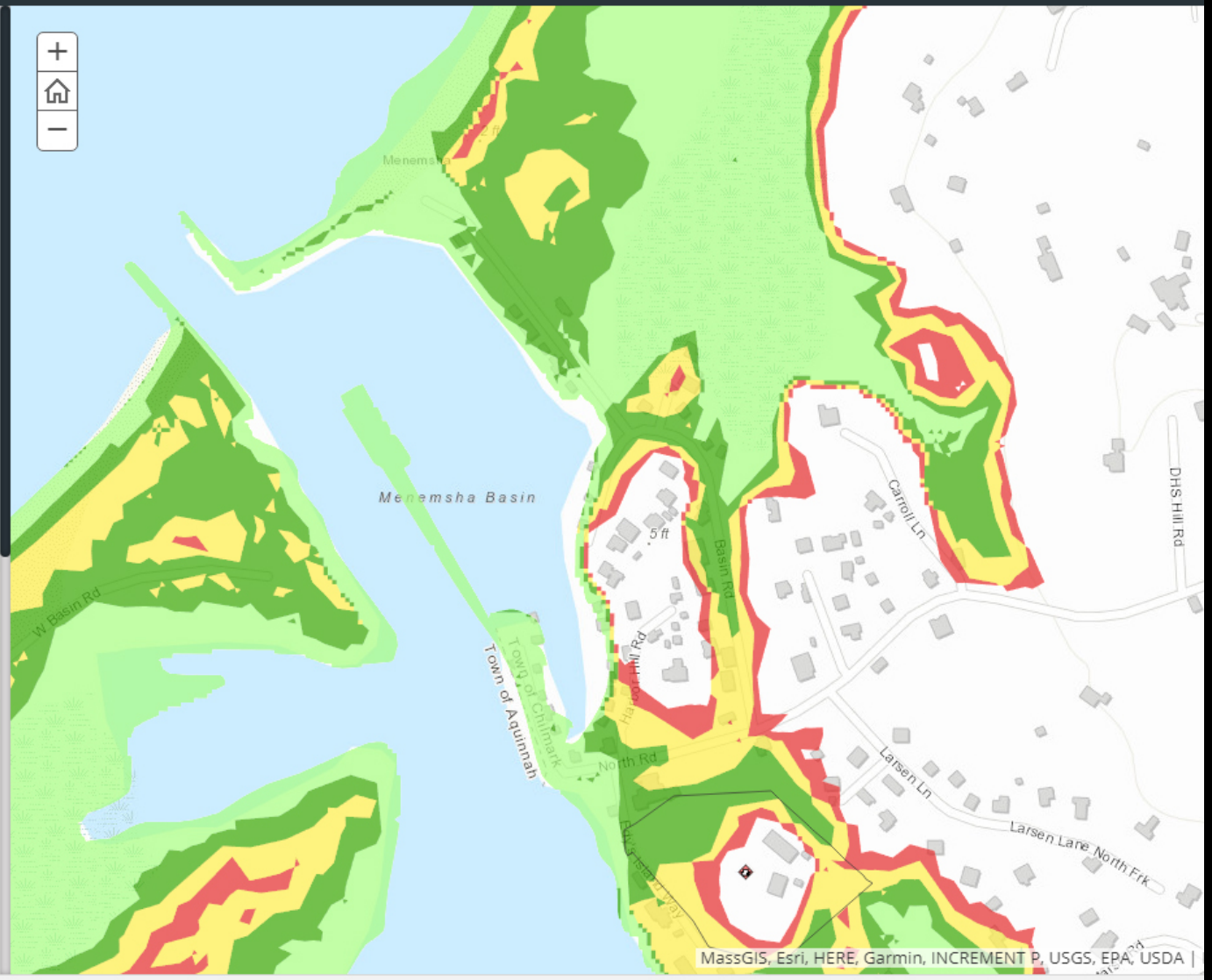
For planning purposes only. Hurricane surge data courtesy of USACE, October 2013. These data were mapped using current sea level. Please see the technical report (PDF, 272 KB) for data sources and processing steps.

Hurricane Surge Scenarios

- Category 1
- Category 2
- Category 3
- Category 4

Public Facilities and Infrastructure

- Airport
- Community Health Center
- Electrical Generation Facility
- Fire Station
- Harbormaster
- Hospital



Massachusetts Sea Level Rise and Coastal Flooding Viewer

Interactive maps of coastal flooding areas and community facilities and infrastructure based on: sea level rise scenarios, Federal Emergency Management Agency coastal flood zones, and hurricane surge models.

Intro | Sea Level Rise | FEMA Coastal Flood Zones | Hurricane Surge

This map displays coastal areas with a 1% annual chance of flooding (A and V zones). These high-risk flood zones are determined by the Federal Emergency Management Agency (FEMA) using models and historical data for storm tides and frequency. This map does not account for sea level rise.

Zoom in until the FEMA coastal flood zones come into view. Community facilities and infrastructure are identified with an icon (zoom in further, if necessary, to view the facility outline). Click the icon for a pop-up box displaying the facility name, type, and town or city. Water levels are provided for AE and VE zones under the FEMA coastal flood zone labels on the map when zoomed in to the appropriate extent. Flood levels represent water depth in feet above 0 NAVD 88, rather than above the ground surface. Coastal flood data can be directly compared for each facility by switching viewer tabs.

For planning purposes only. Flood zone data courtesy of FEMA. These data represent the effective flood zones mapped using current sea level. Please see the technical report (PDF, 272 KB) for data sources and processing steps.

FEMA Coastal Flood Zones

1% Annual Chance Flood Hazard (includes both A and V zones; zoom in to view zone labels)

Public Facilities and Infrastructure

- Airport
- Community Health Center
- Electrical Generation Facility
- Fire Station
- Harbormaster
- Hospital
- Landfill
- Library
- Long-Term Care Residence
- MBTA Commuter Rail Station

Massachusetts Sea Level Rise and Coastal Flooding Viewer

Interactive maps of coastal flooding areas and community facilities and infrastructure based on: sea level rise scenarios, Federal Emergency Management Agency coastal flood zones, and hurricane surge models.

Intro | Sea Level Rise | FEMA Coastal Flood Zones | Hurricane Surge

This map shows the National Oceanic and Atmospheric Administration (NOAA) modeling of coastal flooding above Mean Higher High Water (MHHW, the average height of daily highest tide) with six increasing levels of sea level rise (1-foot increments up to six feet). This map does not account for storm surge, waves, erosion, and other dynamic factors. Future updates to the viewer will include maps that depict water levels from storm-driven flooding under sea level rise scenarios. See CZM's Sea Level Rise Guidance (PDF, 3.0 MB) for more information on sea level rise rates and projections, as well as general advice in the selection and application of scenarios for coastal vulnerability assessments.

Zoom in until the mapped extents of the sea level rise scenarios come into view. Community facilities and infrastructure are identified with an icon and facility outline. Click the icon for a pop-up box displaying the facility name, type, town or city, and water levels under the sea level rise scenarios. Flood levels represent water depth in feet above 0 NAVD 88, rather than above the ground surface. See the Sea Level Rise Scenario figure (PDF, 155 KB) for a visual representation of the information depicted on the map. Coastal flood data can be directly compared for each facility by switching viewer tabs.

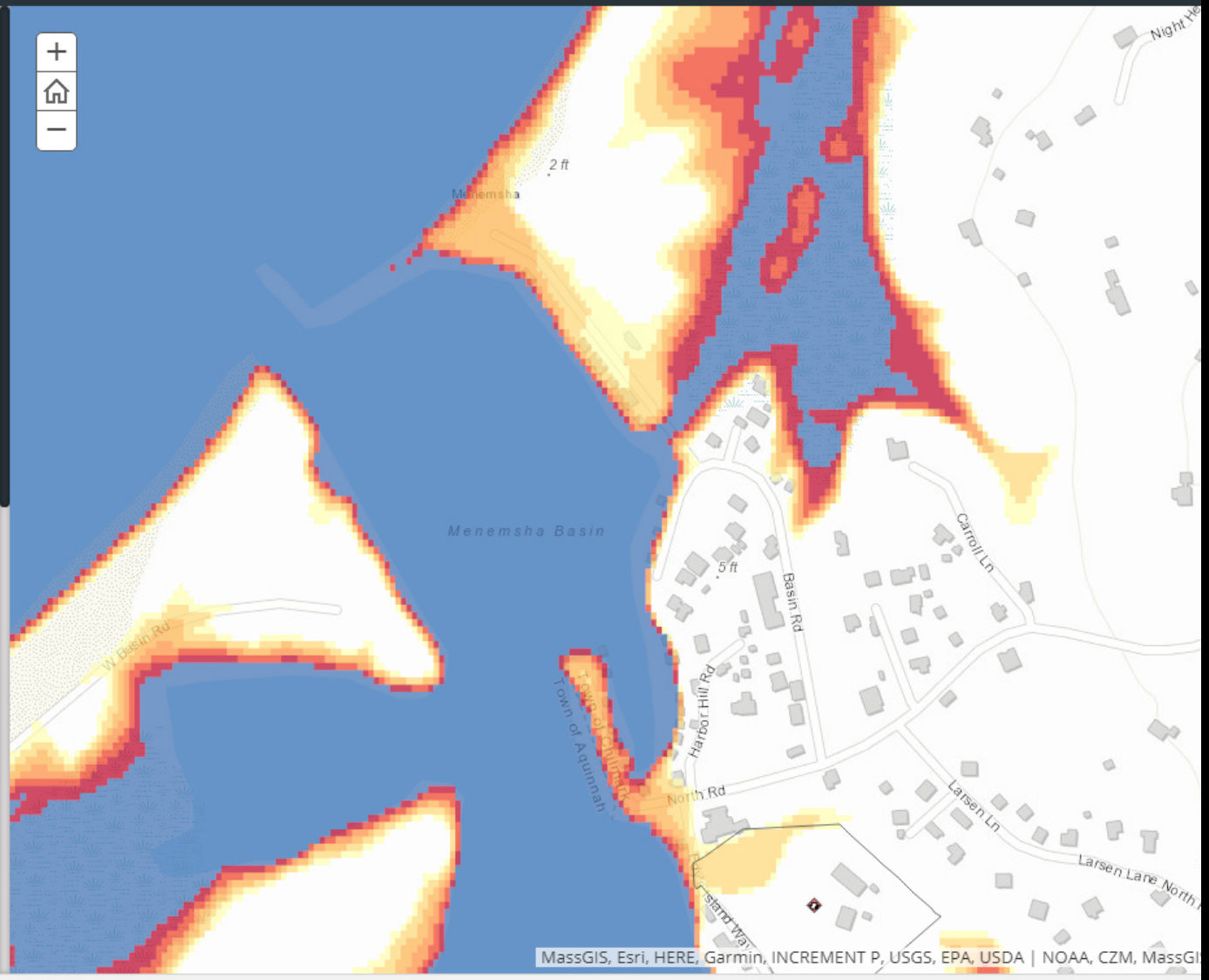
For planning purposes only. Sea level rise data courtesy of NOAA, January 2013. Please see the technical report (PDF, 272 KB) for data sources and processing steps.

Potential Extent of Mean Higher High Water (MHHW) with Sea Level Rise

- MHHW
- MHHW + 1 ft Sea Level Rise
- MHHW + 2 ft Sea Level Rise
- MHHW + 3 ft Sea Level Rise
- MHHW + 4 ft Sea Level Rise
- MHHW + 5 ft Sea Level Rise
- MHHW + 6 ft Sea Level Rise

Public Facilities and Infrastructure

- Airport



Workshop 2: Resilience Strategies

Workshop 2: Resilience Strategies

Build on Strengths:

- Self-sufficiency
- Vulnerable Population Plan
- Public Water Supply Backup
- Resilient Natural Systems

Workshop 2: Resilience Strategies

Manage Stormwater Runoff:

- Update Zoning and Development Regulations
- Treat Road Runoff with Green Infrastructure.

Workshop 2: Resilience Strategies

Reduce Coastal Flood Impacts:

- Resilient Menemsha Plan
- Engineering Upgrades for certain Roads and Bridges
- Protect Beach, Pond and Dune Systems

Workshop 2: Resilience Strategies

Enhance Water Supply:

- Menemsha Storage Tank
- Expand Water Infrastructure
- Install Dry Hydrants
- Enhance emergency sources
- State Forest system backup

Workshop 2: Resilience Strategies

Transportation:

- Improve Ferry Service
- Raise Ferry Terminals to Accommodate Sea Level Rise

Workshop 2: Resilience Strategies

Communication and Grid:

- Select Undergrounding of Power Lines
- Backup Sources of Power, Cell Phone Charging etc

Workshop 2: Resilience Strategies

Reduce Wildfire Risk:

- Forest Fuel Reduction
- Forest Management Plan (including tick management)
- Install Dry Hydrants
- Plan for Climate Impacts

Workshop 2: Resilience Strategies

Public Health and Well-being:

- Tick Testing Equipment
- Elder Services
- Home Medical Care
- Communication and Outreach

Next Steps:

Combined, Chilmark and West Tisbury

- South/State Rd Resilience Corridor
- Forest Management Plan
- Microgrid Plan
- Public Education on Hazard Preparedness

Next Steps:

Chilmark

- Resilient Menemsha Plan
- Upgrade Subdivision Regulations for Appropriate Stormwater Management

The MVP Process in Chilmark and West Tisbury