Community Resilience
Building Workshop

WEST TISBURY AND CHILMARK, MA

SUMMARY OF FINDINGS

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Municipal Vulnerability Preparedness Provider

Prepared For:
Massachusetts Executive Office of Energy and Environmental Affairs
6/30/18

OVERVIEW

West Tisbury and Chilmark are no strangers to weather-related hazards. These two "up-island" towns comprise most of the western half of the island of Martha's Vineyard, and flooding and wind damage from coastal storms and hurricanes is a regular occurrence. The long-term effects of climate change will likely make severe weather events more frequent, and sea-level rise will increase the impact of coastal flooding and erosion. With no direct road access to the mainland, residents have learned to be self-reliant, and the towns plan carefully to respond to severe weather and other emergencies.

In 2015, the Martha's Vineyard Commission drafted the Hazard Mitigation Plan (HMP) for Seven Towns in Duke's County. Emergency managers and stakeholders from Edgartown, Oak Bluffs, Tisbury, West Tisbury, Chilmark, Aquinnah, and Gosnold identified vulnerabilities and priority action items to build resilience against key hazards in each town. The report had a strong focus on enhancing the resilience of the county's infrastructure, with recommendations for specific roads, bridges, beaches, stormwater systems, development regulations, and other elements of the built environment in each town.

The towns of West Tisbury and Chilmark decided to build on these previous hazard mitigation planning efforts by working towards Municipal Vulnerability Preparedness (MVP) certification from the Massachusetts Office of Energy and Environmental Affairs (EOEEA). In 2017, each town successfully applied for

Chilmark and West Tisbury comprise most of the western half of Martha's Vineyard.

The first day of the workshop began with dinner and an introductory presentation.

funding under the MVP program to hold Community Resilience Building workshops and further develop their resilience strategies. While the previous Hazard Mitigation Plan helped to identify key infrastructural vulnerabilities and priority action items that address part of the MVP requirements, the MVP process places additional emphasis on issues of social and environmental resilience, and takes advantage of the latest climate change data and projections.

As described in the following report, the two towns joined forces to hold Community Resilience Building workshops on May 3rd and 6th, 2018. Facilitated by consultants from Dodson & Flinker, the workshops included more than thirty stakeholders, who developed a detailed Risk Matrix outlining key hazards and exploring the impacts of those hazards on vulnerable infrastructure, social and environmental resources. At the final workshop, participants identified potential actions the towns can take to address these vulnerabilities, and set priorities for future action.

COMMUNITY RESILIENCE BUILDING WORKSHOP

The goal of the Community Resilience Building (CRB) Workshop was to build on the 2015 Hazard Mitigation Plan (HMP), especially by identifying a broader range of the community's hazards and vulnerabilities, in order to create an updated list of priorities and actions supported by the latest climate change projections.

Both West Tisbury and Chilmark received MVP grants and decided -- as adjacent towns with a very similar geography, economy, ecology and social structure -- that it would make sense to combine efforts and collaborate on a CRB Workshop process that drew upon expertise from both towns. The project was led by a Core Team that included Jen Rand (Town Administrator, West Tisbury), John Christensen (Emergency Management Director, West Tisbury), Tim Carrol (Emergency Management Director, Chilmark), Jo-Ann Taylor (Coastal Planner, Martha's Vineyard Commission), and Chris Seidel (GIS Coordinator, Martha's Vineyard Commission). The Core Team selected MVP providers Dodson & Flinker to facilitate the process, which began with a kick-off meeting and tour of the towns on March 27, 2018. The Core Team and their consultants developed a schedule and agenda for a two-day workshop series, and over the following weeks recruited a group of invited stakeholders. The 31 participants included representatives from town staff, police and fire, land surveying, state forest management, building inspection, planning board, transit authority, emergency response, airport, education, and other organizations, institutions, and groups.

The Community Resilience Building (CRB) workshop was held between two sessions on May 3 and May 6, 2018. Participants worked together to identify key hazards, infrastructural, societal, and environmental vulnerabilities, and prioritized action items to address climate change-related hazard preparedness for West Tisbury and Chilmark. Breakout groups were facilitated by MVP certified providers Peter Flinker, Dan Shaw, and Nate Burgess (Dodson & Flinker), with assistance from John Christensen (West Tisbury Emergency Management Director), following the structure of the CRB Workshop guide.

The workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern
- Identify existing and future strengths and vulnerabilities
- Develop prioritized actions for the community
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

On the first day of a two-part workshop, participants identified climate-related hazards and vulnerabilities in West Tisbury and Chilmark. On the second day, participants identified and prioritized action items towards building resilience.

The northwest coastline of Chilmark and West Tisbury is mostly characterized by low density single family housing distributed throughout the hilly, forested landscape.

TOP HAZARDS

At the beginning of the workshop, the consultants introduced the workshop process, along with an overview of Massachusetts' current climate change projections, both statewide and downscaled to Duke's county. The consultants also presented a brief summary of the findings from the 2015 Hazard Mitigation Plan for Seven Towns in Duke's County, reminding participants that today's CRB Workshop would add to this list of priority actions, rather than replace them.

Following this, workshop participants were asked to discuss hazards that West Tisbury and Chilmark may face now or in the future. The discussion began with the large group in order to generate a quick list of many possible hazards. A long list was quickly generated, and discussions then continued among the four tables, as each smaller group refined a list of their top four hazards.

Discussion about hazards focused on a few main themes, including hazard events that could pose a risk to the two towns' somewhat isolated rural population (compared to other MV and MA towns), risks to the increasingly aging population, events that could disrupt transportation to the mainland, and events that could disrupt power, communication, and access to infrastructure.

The majority of participants identified the following as top hazards which West Tisbury and Chilmark face:

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

2015 HAZARD MITIGATION PLAN FOR SEVEN TOWNS IN DUKES COUNTY

The Hazard Mitigation Plan (HMP) for Seven Towns in Duke's County identified hazards and vulnerabilities in West Tisbury and Chilmark along with the whole county. The most significant overall hazards include floods and wildfire. Floods are a frequent hazard caused by hurricanes, nor'easters and coastal storms. Hurricanes are rare but very serious, while nor'easters strike more frequently and have been responsible for more damage over time. Between 1864 and 1965 there were at least 24 fires over 1000 acres in size on Martha's Vineyard, though none of this scale have occurred since 1965. Wildfire is a significant threat as dried dead timber accumulates over time throughout all of the island's forested lands. With the steady accumulation of fuel coupled with a lack of a wildfire management plan outside the state forest, wildfire is a significant potential hazard.

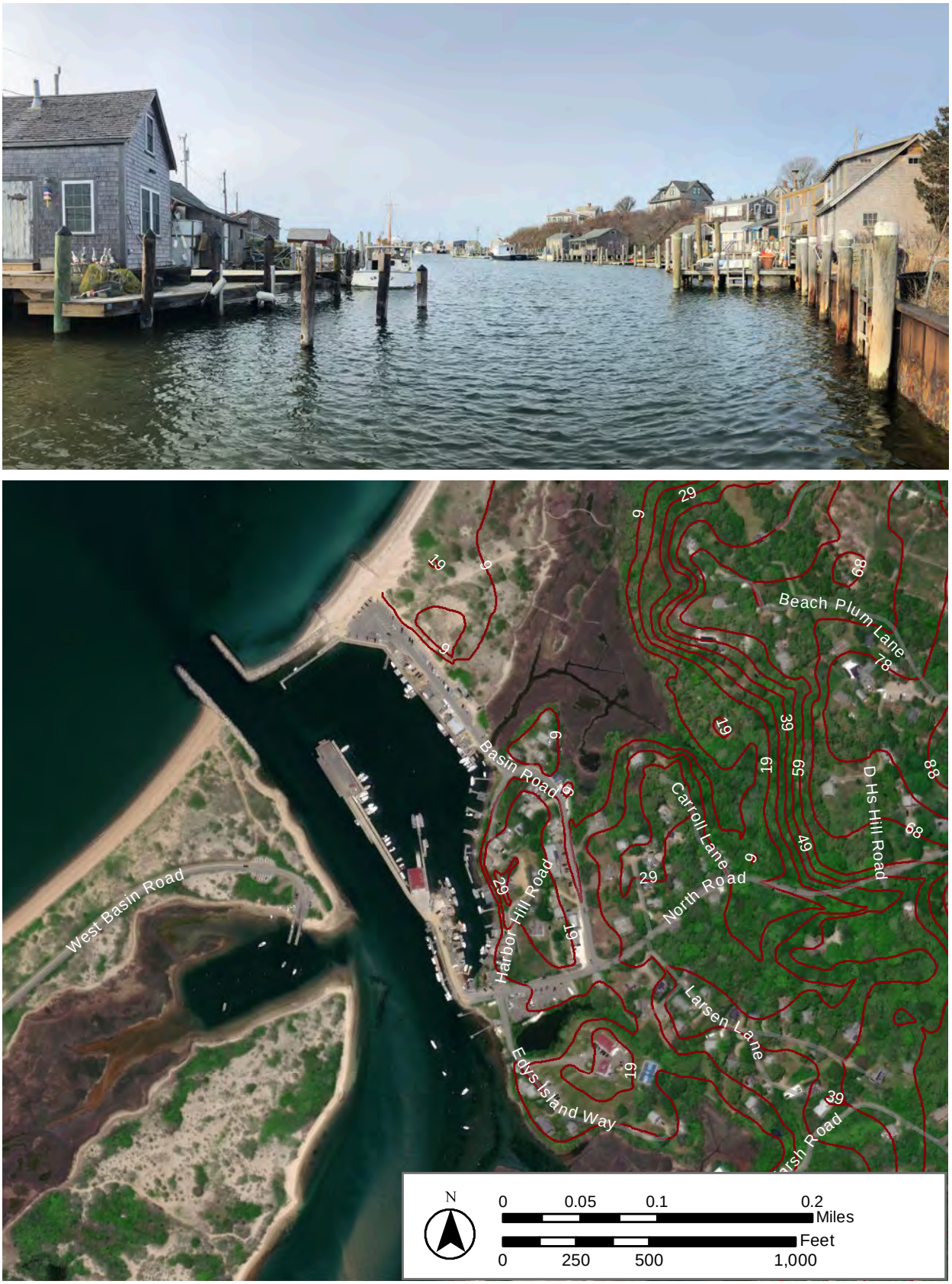
For West Tisbury specifically, the top hazards identified were coastal flooding, severe wind and rain from hurricanes and nor'easters, coastal erosion, sea level rise, and wildfires. The list for Chilmark was similar, including coastal flooding and severe wind and rain from hurricanes and nor'easters.

A summary of West Tisbury's vulnerability from the HMP is as follows:

- About 3,400 people (summer) live within areas considered at risk for wildfire. Vulnerable facilities in these areas include 900 residential buildings; 39 commercial buildings; 16 municipal, public, or non-profit buildings including the fire station; Mill Brook Bridge; 500 ft of transmission line; and stretches of South Rd / State Rd.
- About 40 people (summer) live within 100 year flood zones.
- Over 100 people (summer) live within SLOSH category 4 (this could potentially increase to over 300 people under buildout). Critical infrastructure potentially inundated by hurricanes includes a few hundred feet of Tiah's Cove Rd.
- Only about 4 people live in areas directly inundated by 4' of sea level rise.

A summary of Chilmark's vulnerability from the HMP is as follows:

- About 2,300 people (summer) live within areas considered at risk for wildfire. Vulnerable facilities in these areas include 538 residential buildings; 2 commercial buildings; 3 municipal, public, or non-profit buildings; and stretches of South Rd / State Rd.
- About 220 people (summer) live within areas at risk of flooding. Within the 100 year flood zone are 51 ft of State Rd near Aquinnah and 96 ft of State Rd near West Tisbury.
- About 280 people (summer) live within SLOSH category 4. Hariph's Creek Bridge is also within this zone.
- About 30 people live in areas directly affected by 4' of sea level rise.



Menemsha, a fishing village in Chilmark, is the only population center close to sea level in either town. The map above shows 3 meter contours, labeled in feet.

VULNERABLE AREAS

Patterns of development throughout both towns are low density and distributed, with vulnerable resources spread across the landscape. The only population center directly on the coastline is the small village of Menemsha in Chillmark, which was identified as a specific area of concern. The town centers of West Tisbury and Chilmark are located inland and high enough in elevation to be less at risk from coastal hazards like storm surge and sea level rise.

However the decentralized nature of the two towns poses its own set of vulnerabilities, including the risk of elderly or disabled residents being isolated during disruptive storm events, or roads and power lines being cut in multiple locations by downed trees. Other areas of concern were specific vulnerable points along roads, at risk of inundation or washing out in a severe weather event. Isolated houses throughout the forest are vulnerable to wildfire. Many of these were identified by the Hazard Mitigation Plan and remain as priority items. Discussions on hazards were often based on specific references to these areas of concern, which included:

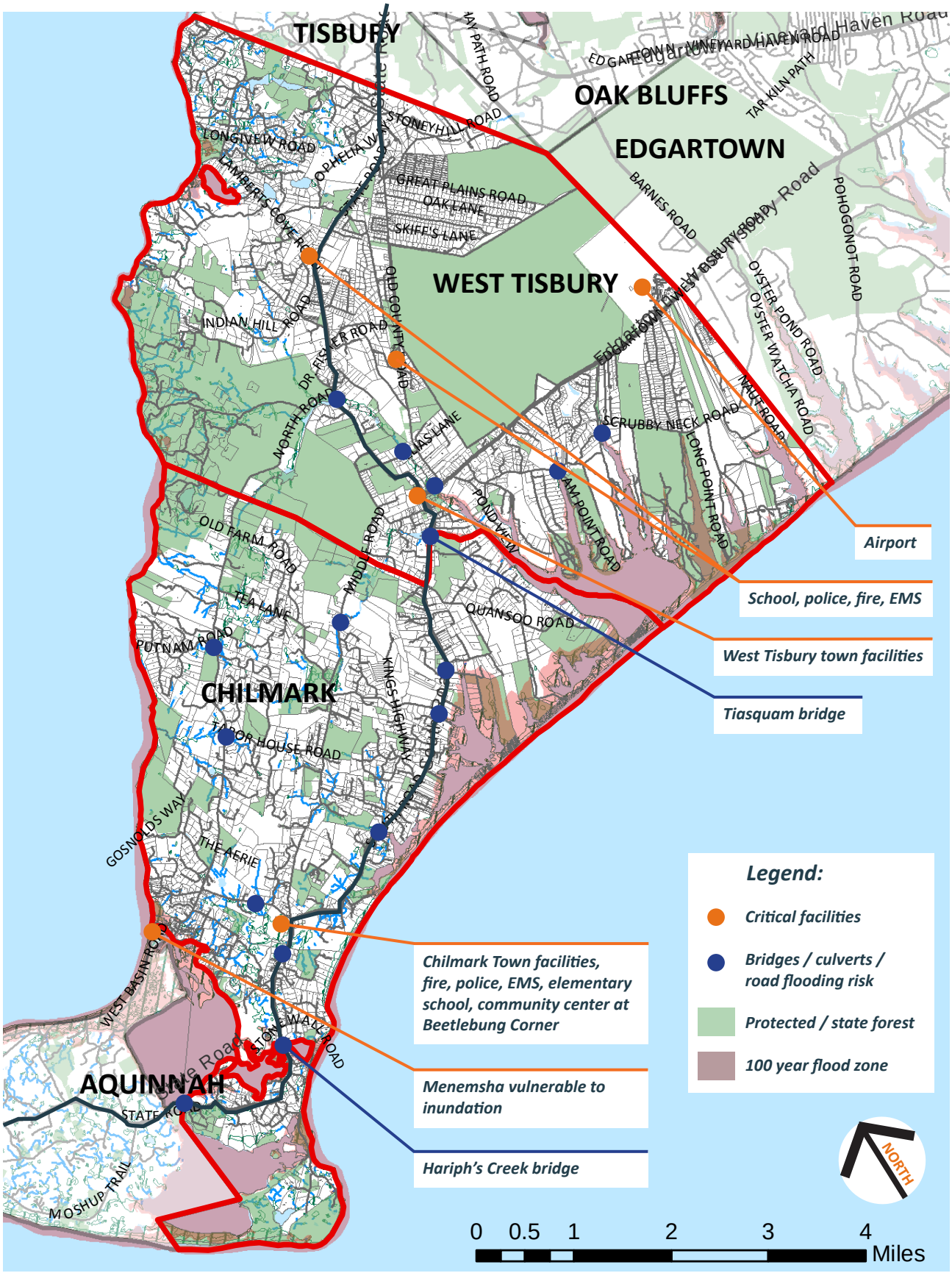
- Menemsha: Largest concentration of residents and buildings directly on the shoreline, vulnerable to inundation from storms and sea level rise
- Elders' homes: Growing elderly population lives de-centralized throughout the rural landscape
- Roads and culverts: Need for short-term infrastructure improvements including Hariph's Creek Bridge
- Ferry terminals and airport: Located in other towns but serve as the primary connection to the mainland
- Coastal environments: Ponds, dunes, beaches
- Forests: Habitat for growing tick population carrying Lyme and other vector borne diseases; significant wildfire threat
- Aquifer: Dependence on electricity to pump private well water; issues of water access for fire fighting, during power outages, and during drought

CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS

Wildfire: the threat of wildfire came up at all tables at the workshop. Martha's Vineyard has not experienced a wildfire larger than 100 acres since a 1200-acre fire in 1965. Because of the homogenous forest canopy throughout both towns and the accumulation of fuel over the decades, many workshop participants voiced concern that West Tisbury and Chilmark residents live with a significant risk of a major wildfire. Some participants recalled that in the 1960s the forest structure across the island was both shorter and less continuous than it is now. Without a forest management plan, dead wood has been steadily accumulating in these forests. Not only is the fuel supply increasing, but the number of houses spread throughout the towns' forest has increased dramatically since the 1960s, which led participants to suggest that the impact of a large scale wildfire today could be much more catastrophic than in the past.

Vector borne disease associated with an exploding tick population was another major area of concern, which some groups included with forest management due to this connection with wildlife populations. Many residents view the spread of Lyme disease as an epidemic.

Extreme Storm Events: Coastal storms were discussed as a major hazard. While Vineyarders are relatively self-sufficient and capable of weathering these storms, there are basic infrastructural disruptions which could have severe impacts to people living in these up-island towns. If a hurricane or nor'easter caused a power outage, for example, well water pumps would cease to operate, cutting off water supplies for most homes. A sustained power outage could also become a communication blackout if people are unable to charge their mobile devices. Besides power, other key infrastructure which affects the whole of Martha's Vineyard is residents' dependence on the ferry system for the majority of transportation to and from the island. Whereas a typical town has many roads leading in and out, the six Martha's Vineyard towns rely entirely on water and air travel for all transportation and supply access to the mainland. If an extreme storm event were to disrupt any of these single ferries, terminals, or airport infrastructure, the whole island would be severely impacted.



Participants in the workshops identified areas of concern, including critical facilities, infrastructure, and bridges and culverts. See appendix for full workshop maps.

Coastal Flooding: Inundation from storms and sea level rise was identified as a hazard largely affecting coastal ecosystems such as marshes, ponds, sand dunes, and barrier beaches. The only relatively dense coastal population center between the two towns is the village of Menemsha in Chilmark, which was identified as an area of concern.

Aging Population: Any hazards identified in West Tisbury and Chilmark have to be considered in light of these two towns' aging population. In West Tisbury, by 2035 the population over age 65 is expected to double, reaching 34% of the town's population. In Chilmark, by 2035 the population over age 65 is expected to increase from 22% to 34%.[1] Future hazards will increasingly impact an older, isolated/distributed population, requiring adequate communication procedures and response capacity be in place.

1 West Tisbury Housing Production Plan FY2018-2022. Prepared by JM Goldson with RKG Associates.

CURRENT STRENGTHS AND ASSETS

Self-Sufficiency: In general, the independent and self-sufficient nature of year-round island residents was identified as a major asset towards maintaining resilience in West Tisbury and Chilmark. Year-round residents are accustomed to periods of enforced isolation during winter storms, occasional interruptions in supplies and other challenges. Most importantly, most are active participants in community life and look out for one another.

Vulnerable Population Plan: Emergency managers and hospitals in the area maintain a confidential list of priority residents to reach in the event of a power and communication outage. This is important in these two towns where elders and people with regular medical needs live in a somewhat isolated, low-density rural area, and may not be able to seek help during a hazard event or in its aftermath. The importance of this priority list was emphasized by workshop participants. Some even suggested ideas like this without knowing that this system was already embedded in the towns' emergency response procedures, which revealed to the core team that some of the towns'

After completing their CRB Matrices in small groups, each group shared their top findings with the rest of the workshop group.

strengths and assets would benefit simply from more public awareness.

Public Water Supply Backup: Chilmark has a designated public water source with a backup power supply, where residents can go to fill water containers in emergency situations. This feature could benefit from more public awareness since some participants suggested ideas that were very similar to this in their action items lists. Improving access to West Tisbury's emergency public water supplies would further enhance this asset.

Resilient Natural Systems: The towns' dunes, beaches, marshes and ponds, while vulnerable to climate change hazards in their own right, do serve as an extremely valuable asset in protecting residents from the effects of coastal flooding and storm surges. Protecting and enhancing these resources would continue to make this part of Martha's Vineyard even more resilient.

TOP RECOMMENDATIONS TO IMPROVE RESILIENCE TO HAZARDS

Participants in the Community Resilience Building workshop identified dozens of potential actions to address climate change, sea level rise, flooding and other challenges. Each of the breakout groups presented its priority actions to the whole group, and at the end of the session each person voted on their top priorities. These have been compiled into the following list of general priorities. Below each one is a list of specific actions that emerged from the workshop discussion, supplemented by strategies that came out of the 2015 Hazard Mitigation Plan (HMP).

MANAGE STORMWATER RUNOFF

One of the primary impacts of climate change is expected to be more frequent severe storm events, heightening the importance of stormwater management. Requiring development to handle stormwater appropriately on site to reduce the concentration of flows was an important strategy discussed at the workshop. Concentrated stormwater flows can easily wash out roads and other key infrastructure, especially along low-lying roads over culverts, and on private dirt roads. Such disruptions can severely impact emergency access, compounding the severity of hazard events.

Stormwater concentrations also have an impact on natural systems from the erosion and water quality issues they cause. Because West Tisbury and Chilmark's dunes, marshes, ponds, and beaches provide resilient natural protection against storm surges, protecting these environments from damaging stormwater impacts is of critical importance.

- Update Zoning and Development Regulations at All Levels to Require More Responsible Stormwater Management, Onsite When Possible

- HMP: Divert Town Road Runoff into Roadside Vegetated Areas, Rather than Concentrating it into Stream Crossings

REDUCE COASTAL FLOOD IMPACTS

Participants agreed that flooding from severe storms posed a significant threat to roads. Whereas typical towns in Massachusetts are surrounded by an interconnected network of roads, West Tisbury and Chilmark's island geography can result in only one road connecting entire large areas to the rest of the island. Participants reinforced the Hazard Mitigation Plan's recommendations to upgrade key road segments where flooding or erosion would leave populated areas stranded.

- HMP: Establish South Road as a Critical Facility, Protect Against Storm Surge and Sea Level Rise
- HMP: Engineering Upgrades and Raising Hariph's Creek Bridge
- HMP: Engineering Upgrades and Raising Low Lying Areas of Tiah's Cove Rd
- Professional and Technical Planning For Menemsha against Storm Surge and Sea Level Rise

WATER SUPPLY – DROUGHT AND STORM RESILIENCE

Since nearly all West Tisbury and Chilmark residents depend on private well water which is accessed by electric pump systems, disruptions to the electrical grid result in a lack of water access. Participants identified ways to improve private access to wells, along with recommendations for emergency public water access in key locations.

- HMP: Alternatives to Well Water Supply for Certain Areas where Wells wouldn't be Adequate During Drought or Wildfire
- HMP: Install 8,000 Gal Water Tank for Menemsha
- Hand Pumps or Other Methods Independent of the Power Grid for Accessing Private Well Water
- Enhance Emergency Public Water Sources (independent of power grid) in West Tisbury, similar to Chilmark's

TRANSPORTATION AND COMMUNICATIONS

The up-island towns' geography can make it challenging for people to reach one another during hazard events, through both transportation and communication. Participants identified goals of improving these networks' resilience to climate change.

Participants suggested long-range goals of improving the management of the ferry system, as well as continued engineering improvements to the ships themselves and the ferry terminals including raising the elevations of the ferry terminals over time to adjust to sea level rise.

Within West Tisbury and Chilmark, a rural and aging population requires that resilient communication infrastructure and well-established hazard response procedures be in place. In addition, there are residents who depend on access to home medical care who also live distributed throughout this large rural area, and response to their individual needs in the event of a hazard requires deliberate planning in advance.

- Improve Ferry System
- Engineering Improvements for Ferry Terminals to Respond to Sea Level Rise
- Continue and Enhance Communication and Transportation for Elders and People with Medical Needs, as Part of Post-Event Response
- Backup Power Sources for Vulnerable Residents' Cell Phones, and Backup Power for Emergency Responders' Communication Infrastructure
- Selective Undergrounding of Most-Vulnerable Wires

FOREST MANAGEMENT, FOR WILDFIRE AND VECTOR BORNE DISEASE

Workshop participants voiced the need for a forest management plan to reduce the accumulation of combustible fuel throughout the island, maintain and

create additional fire breaks within the State Forest, and help control the population of ticks. Such efforts will need to include education and public awareness of forest management practices, since a significant amount of the area's forests are owned and managed by private homeowners. In addition, it was suggested that the town or the island's medical facilities invest in tick-disease detecting equipment, in order to more effectively stop the spread of Lyme and other tick-borne diseases.

- Forest Fuel Reduction, Dead Wood Removal
- Fire Breaks
- Expnand Fire Fighting Water Sources, Dry Hydrants
- HMP: Forest Management Plan
- Build Public Awareness on Forest Management, Including for Private Landowners
- Population Management of Vector Species such as Deer and Ticks
- Obtain Tick Disease Detecting Equipment

NEXT STEPS

The core team took the top priority actions from these categories and developed a short list of the top projects for each town, to seek funding for implementation. These projects were conceived with the goal of achieving multiple priority actions from different categories simultaneously. These projects are organized into three lists: West Tisbury, Chilmark, and combined between the two towns.

COMBINED

South Rd/ State Rd Resilience Corridor

Establish South Rd / State Rd as a resilience corridor, since it's the only route connecting all three up-island towns. Upgrade bridges, culverts, and other crossings (including Hariph's Creek Bridge, North Tisbury culvert, others) to accommodate more severe flows from stormwater runoff and storm surges without disruption. Upgrade and improve road-adjacent dams in West Tisbury per HMP recommendations. Filter runoff from road using vegetated swales and other green infrastructure techniques, to preserve water quality and reduce runoff volumes. Consider adding other important or vulnerable routes to this project, such as Tiah's Cove Rd in West Tisbury and Middle Rd in Chilmark. Because this corridor is shared between the towns and State/ South Rd is in MassDOT's jurisdiction, forming partnerships with MassDOT will be of key importance.

Forest Management Plan

A forest management plan should involve collaboration between DCR, the island's fire departments, private landowners through land management education programs, and the towns of West Tisbury, Chilmark, and eventually other municipalities. Parts of a plan currently exist, including West Tisbury's participation in Firewise, but these efforts would benefit from integration within a more comprehensive plan. Establishing an effective plan will require deliberate planning, public engagement, education, and coordination between agencies. The plan should provide a way to reduce the buildup of wildfire fuel, create fire breaks, expand water access for firefighting, build public awareness on forest management practices for privately owned land, and enhance participation in

the Firewise program. This forest management plan should also include ecological management strategies to reduce the abundance of disease-carrying ticks.

Microgrid Plan

The towns of West Tisbury and Chilmark should study the potential to develop microgrids within the two towns, so that the whole area doesn't experience a total blackout when one part of the electric grid is disrupted. This can include studies on solar power for certain areas, or other local sources of electricity. This plan should identify key places for undergrounding the most vulnerable wires, as well as offering solutions for vulnerable residents to keep their cell phones charged during power outages and to be able to retain the use of pumps for private well water access and other critical home infrastructure dependent on electricity.

Public Education Program on Hazard Preparedness

West Tisbury and Chilmark already have many hazard preparedness measures in place, which would benefit from greater public awareness. There were ideas suggested at the workshops that are already in practice (such as maintaining a priority list of vulnerable residents to reach during hazards), which indicated to the core team that more public knowledge of those resources was needed. Because the populations of both towns are generally independent and self-reliant, information about resources and hazard preparedness and response practices would be put to good use among individual residents here. A public education and outreach program on hazard preparedness could include hiring a resilience coordinator for the area. A project such as this could start in West Tisbury and Chilmark through MVP implementation, but should ultimately expand to encompass all of Martha's Vineyard.

CHILMARK

Resilient Menemsha Plan

Menemsha is a unique place, as the one densely settled village in Chilmark. Much of this fishing village is situated very close to sea level, and will be increasingly impacted by storm surges and flooding as sea level rise increases over the next century. A plan should be developed that identifies appropriate elevations for docks, bulkheads, buildings, and critical infrastructure to be safely rebuilt as upgrades and redevelopment happen over time. The plan should also include strategies to enhance Menemsha's natural defenses and ecological infrastructure, with consideration as to how these strategies would interface with changes in the built environment over time. The process should include stakeholder workshops and public outreach. The final plan should offer strategies to protect and enhance the economic vitality and cultural identity of this historic fishing village as its climate change resilience strategies develop.

Upgrade Subdivision Regulations for Appropriate Stormwater Management

Subdivision regulations should be updated to require appropriate stormwater management on site, including green infrastructure and low impact development techniques to the extent possible, in order to minimize erosion, flooding, and water quality issues downstream. These standards should be applied to road access permits as well. All town regulations should require that surface runoff calculations factor in the increasing frequency of severe storms, and that town boards incorporate this into their reviews of new development or redevelopment.

WEST TISBURY

Enhance Emergency Public Water Supply

West Tisbury has emergency public water supplies in several of its town facilities, including the library and schools. These water supplies are equipped with backup generators, to make water accessible during a blackout. These are valuable resources, offering residents the ability to fill water containers during power outages when offline electric pumps make private well water inaccessible. The effectiveness of these emergency public water supplies could be enhanced with a minimal amount of management, infrastructural enhancement, and public outreach.

RECOMMENDATIONS FROM HAZARD MITIGATION PLAN[1]

General recommendations for Dukes County towns overall included:

- Increase capacity in adaptation to climate change, by incorporating 25-year storm calculations rather than 10-year volume into regulations and public infrastructure planning. Establish management plans for state forests, to reduce fire risk, and participate in DCR Firewise program.
- Plan and build drought-resistant infrastructure for water supply.
- Continue mapping and estimates of structures within 100 year floodplain.

In addition to these overall recommendations, specific recommendations were made for individual towns. For West Tisbury, recommendations were assigned a score indicating their level of priority. Higher priority recommendation included:

- In order to reduce the impacts of drought and wildfire, establish an overall management plan for the State Forest.
- In order to reduce the impacts of drought and wildfire, install new public water supplies and water supply lines within State Forest
- Reduce flood impacts by identifying and correcting discharges from Town and Commonwealth roadways where they cross streams, including: Mill Brook (West Tisbury portion), Tiasquam (West Tisbury portion), Black Brook (West Tisbury), and Witch Brook (Tisbury). The road surface at each crossing should be adjusted during repaving to divert as much runoff as possible into roadside vegetation before it reaches the road crossing.
- Consider potential need for and options to provide water supply to areas with a development pattern that may not be compatible with continued private well water supplies, which may not be adequate in the event of emergencies such as drought and wildfire; build the necessary infrastructure.
- Install new public water supply lines within state forest, to prepare for wildfire and drought.
- Maintain and monitor dams for Priester's Pond, Mill Pond, and Looks Pond, which could threaten to wash out adjacent roads in case of failure or breach.
- Establish South Rd from town line to town line as a critical facility, prioritizing sea level rise protection and storm water management.
- Ensure town bylaws don't prevent homeowners from using fire-wise roofing materials.

Specific recommendations for Chilmark included:

- Establish South Rd as a critical facility from town line to town line and prioritize its storm protection and adaptation to rising sea level. Protect and possibly elevate the bridge adjacent to Stonewall.
- Install 8000 gal tank for Menemsha public water supply.
- Install dry hydrants to pump pond water for fire-fighting.
- Review and possibly amend Coastal District and other overlay regulations for hazard mitigation.
- Reduce volume of damaging stormwater discharge onto beaches.
- Review/revise subdivision regulations for better stormwater management.

1 Hazard Mitigation Plan for Seven Towns in Duke's County. Draft February 2015.
Prepared by the Martha's Vineyard Commission.

CRB Workshop Participants

indicates participation in group workshop exercises

First	Last	Entity
Brian	Athearn	MV Agricultural Society
Bill	Austin*	VLSE: land surveyor
Joyce	Bowker	Council on Aging
Sandy	Broyard*	Chilmark Conservation Commission
Chris	Bruno*	Mass. State Forest
Brock	Callen*	Sail Martha's Vineyard
John	Christensen	WT Emergency Mgmt Director
Suzanne	Cioffi*	Vineyard Transit Authority
Barbara	Conroy	Polly Hill Arboretum CFO
Peter	Cook*	Chilmark Planning Board*
Nan	Doty*	Educator, Chilmark
Warren	Doty*	Chilmark Selectman
Jim	Feiner*	Chilmark Housing Committee
Julie	Flanders*	Real Estate, Chilmark
Whit	Griswold*	WT Cons Comm
Robert	Hannemann*	Chilmark Finance Advisory Committee
Sam	Hart*	Adult Continuing Education MV
Russel	Hartenstine*	WT Emergency Management
Kent	Healy*	WT Selectman, Kent Healy PE
Omar	Johnson*	WT Health Agent
Ginny	Jones*	WT Planning Board
Donna	Lowell-Bettencourt*	WT School Principal
Heather	Maciel	Tree and Landscape Maintenance
Vincent	Maciel	Tree and Lanscape Maintenance
Joan	Malkin*	Chilmark ConsCom, MV Commission
Skipper	Manter*	WTPD Lt.; WT Selectman
Matt	Mincone*	WTPD
Cynthia	Mitchell*	WT Selectman, CEO Community Health Center
Paddy	Moore*	Healthy Aging
Chris	Murphy*	Chilmark Zoning Board of Appeals, ConCom
Richard	Olsen*	WT, Highway Superintendent
Richard	Osnoss*	Chilmark Planning Board
Jennifer	Rand	WT Town Administrator
Ann	Richart*	MV Airport
Chris	Seidel*	MVCommission, GIS
Candy	Shweder*	Chilmark Conservation Commission
Bonnie	Stacey*	MV Museum
Jo-Ann	Taylor*	MV Commission
Joe	Tierney*	WT Building Inspector
Eunice	Youmans*	Trustees of Reservation

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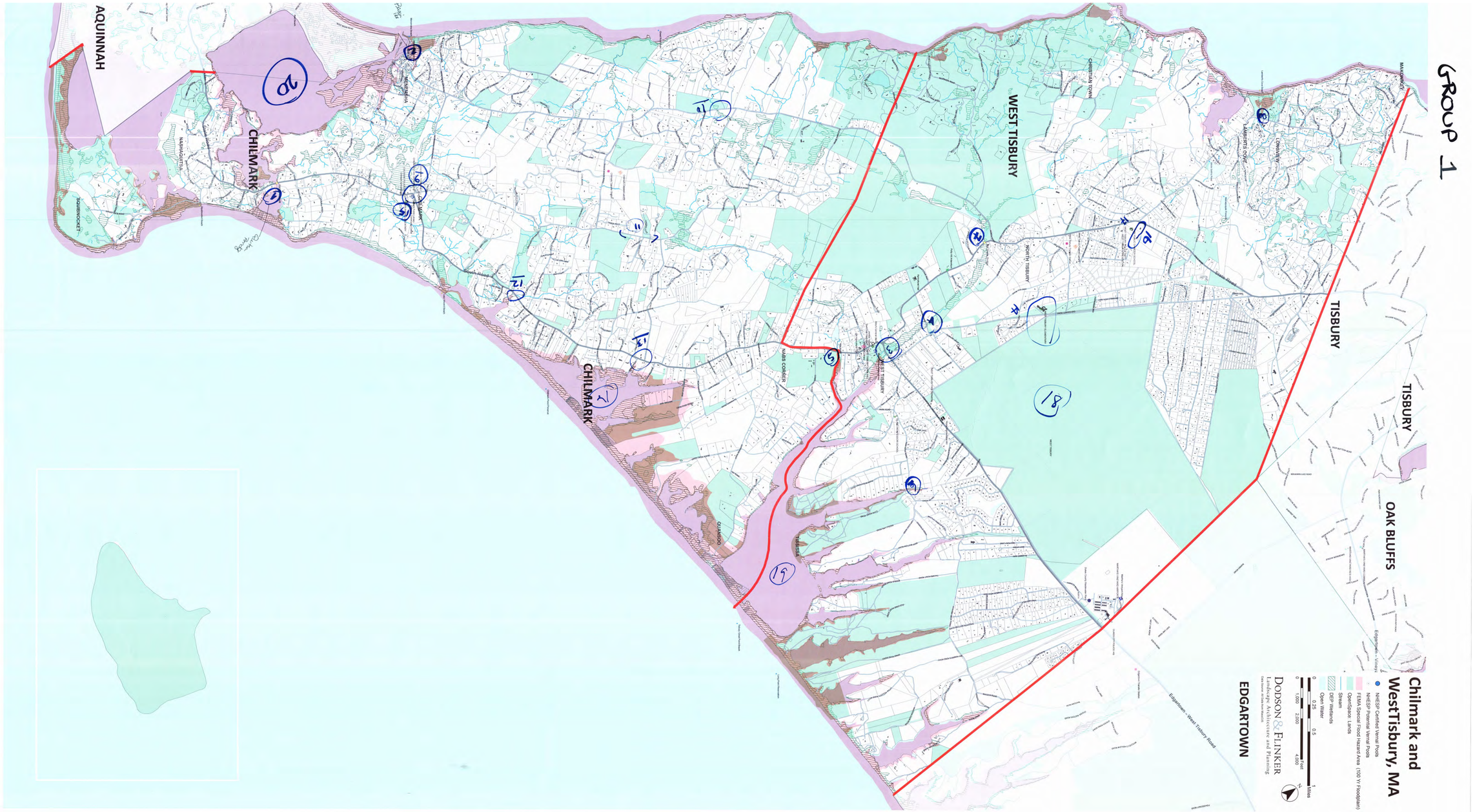
CRB Workshop Project Team

Organization	Name	Role
West Tisbury, Town Administrator	Jennifer Rand	MVP Core Team
West Tisbury Emergency Management Director	John Christensen	MVP Core Team, Facilitator
Chilmark Emergency Management Director	Tim Carroll	MVP Core Team
Martha's Vineyard Commission	Jo-Ann Taylor	MVP Core Team, 2015 HMP Author
Martha's Vineyard Commission	Christine Seidel	MVP Core Team
Dodson & Flinker	Peter Flinker	MVP Provider, Facilitator
Dodson & Flinker	Dan Shaw	MVP Provider, Facilitator
Dodson & Flinker	Nate Burgess	MVP Provider, Facilitator

Citation

Flinker, Peter and Daniel Shaw (2018). Towns of West Tisbury and Chilmark Community Resilience Building Workshop Summary of Findings. Dodson & Flinker.

APPENDIX A: WORKSHOP GROUPS' ANNOTATED MAPS AND COMPLETED MATRICES



#1

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	SEVERE STORMS	DROUGHT / WILD FIRE	ECOSYSTEM CHANGE	SEA LEVEL RISE	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
PUBLIC ROADS & BRIDGES #1–13	S	PUBLIC	V	ENGINEERING/ IMPROVEMENTS ✓	WIDENING AND IMPROVEMENTS TO FIRE ROADS		RETREAT ELEVATING/ PROTECTING	H	
MENEMSHA HARBOR & COAST GUARD STATION	S	50% + PUBLIC	V/S	ENGINEERING IMPROVEMENTS		DREDGING	ENGINEERING IMPROVEMENTS	M	
ELECTRICAL & COMMUNICATION/INTERNET	T	PRIVATE	V/S	MORE SOLAR MICROGRIDS	GRID ✓ MODERNIZATION CELL SERVICE			H	
WATER SUPPLY (AQUIFER)	T	MOSTLY PRIVATE	V/S	(E-) PUBLIC WATER	INCREASE FIREFIGHTING CAPABILITIES STATE FOREST			H	
OFF-ISLAND TRANSIT (FERRY & AIRPORT)	S	PUBLIC/ PRIVATE	V/S	FLEET MODERNIZATION	STATE FOREST FIRE EQUIPMENT		TRANSFER BRIDGE ELEVATED		
SCHOOLS #14–16	S	PUBLIC	S	CHILMARK SCHOOL BACKUP GENERATOR	W. T. SCHOOL VULNERABLE			L	
Societal									
MEDICAL CARE #17 RX DOCTORS OFFICES	S	PRIVATE	S	* IMPROVE COMMUNICATION		LIVING SUSTAINABLY		H	
AGING POPULATION	T	PRIVATE	V	* EDUCATION IDENTIFYING VULNERABILITIES			EDUCATION IDENTIFYING HOMES OUTREACH	H	
PUBLIC SAFETY (ALSO I*)	S	PUBLIC	S/N	* TRAINING			MORE SERVICES ELDERLY HOMES	H	
LOW-MIDDLE INCOME POP. (AFFORDABLE HOUSING)	T	PRIVATE/ PUBLIC	V/S	*					
HOMELESS POPULATIONS	T	PUBLIC (TOWN) PRIVATE (OVERNIGHT)	V	*		WARMING SHELTER?		L	
BUS/PUBLIC TRANSIT (I*)		PUBLIC	S	*		✓			
Environmental									
POND/STREAM ECOSYSTEMS	T	PUBLIC/ PRIVATE	V/S	CULVERT REPLACEMENT			✓CULVERT REPLACEMENT	H	
WETLANDS	T	PRIVATE	V/S				PLAN FOR RETREAT	H	
FISHERIES	T	PUBLIC	V/S			HERRING RUNS			
DUNES	S	MOSTLY PRIVATE	V/S					L	
BARRIER BEACHES	S	PUBLIC/ PRIVATE	V/S				ALLOW RETREAT		
(#18) STATE FOREST AND OTHER PROTECTED OPEN SPACE	T	PUBLIC	V/S		✓ FUEL REDUCTION	✓		H	

* I = INFRASTRUCTURE

MORE WATER STORAGE ?

BUS/ PUBLIC TRANSIT

SOCIAL AGE POPULATION

GROUP 2

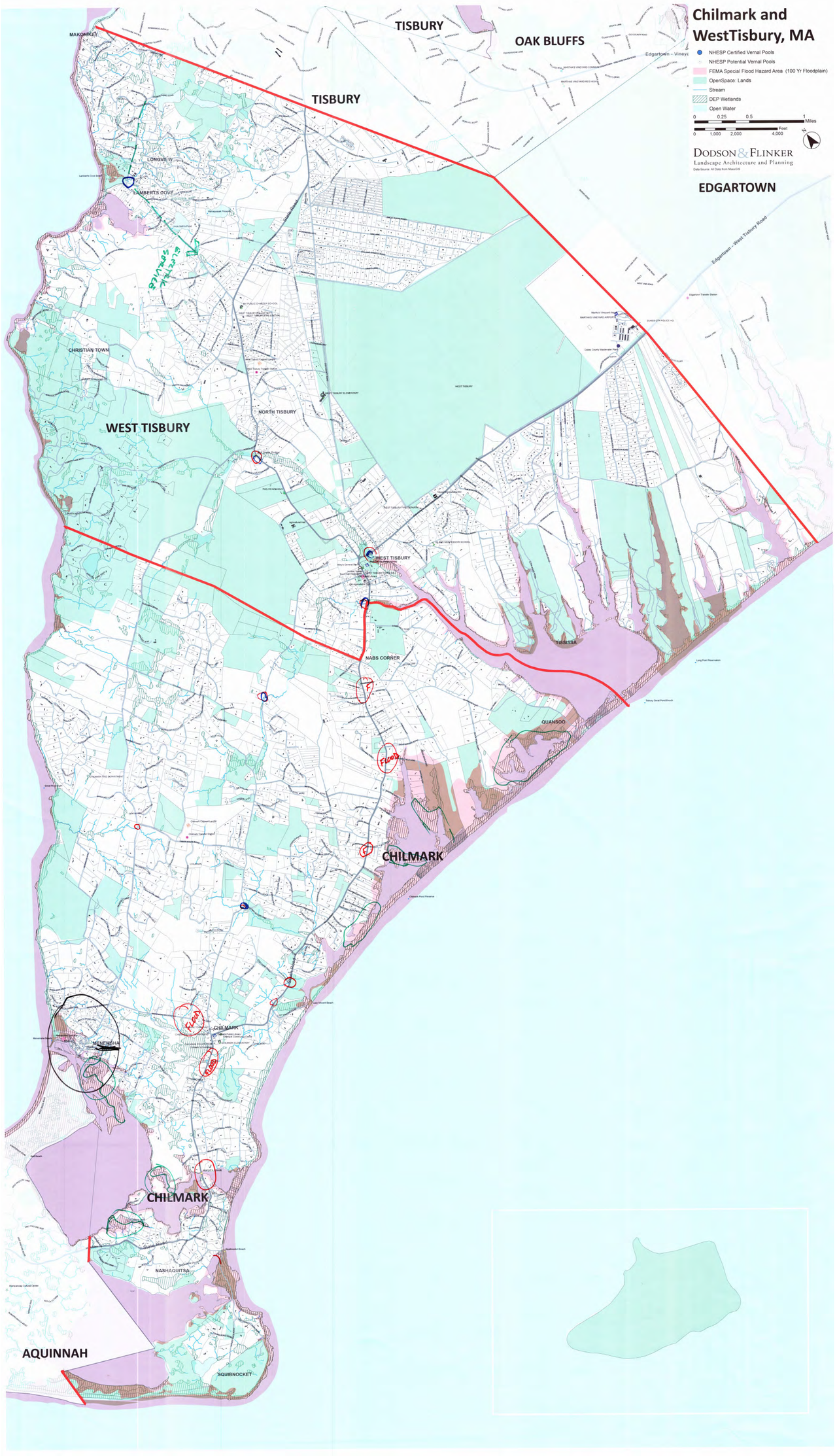

Chilmark and
WestTisbury, MA
NHESP Certified Vernal Pools
NHESP Potential Vernal Pools
FEMA Special Flood Hazard Area (100 Yr Floodplain)
OpenSpace: Lands
Stream
DEP Wetlands
Open Water
0 0.25 0.5 1 Miles
0 1,000 2,000 4,000 Feet
DODSON & FLINKER
Landscape Architecture and Planning
TISBURY
OAK BLUFFS
EDGARTOWN
MAKONIKEY
LONGVIEW
LAMBERTS COVE
ELECTRIC SERVICE
CHRISTIAN TOWN
WEST TISBURY
NORTH TISBURY
NABS CORNER
TISSISSA
QUANSOO
CHILMARK
MENEMSHA
NASHAQUITSA
AQUINNAH
SQUIBNOCKET
Edgartown - West Tisbury Road

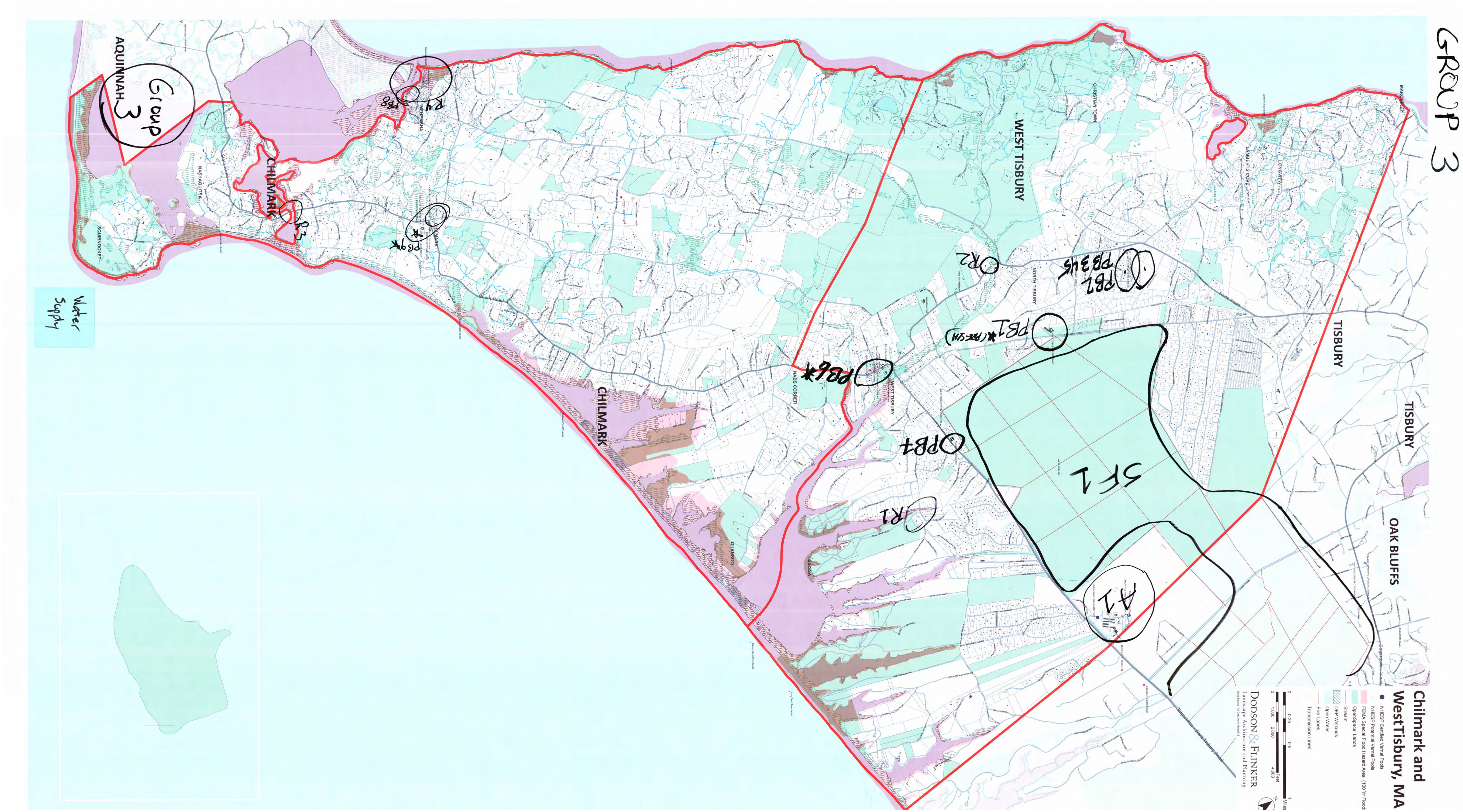
TABLE 2

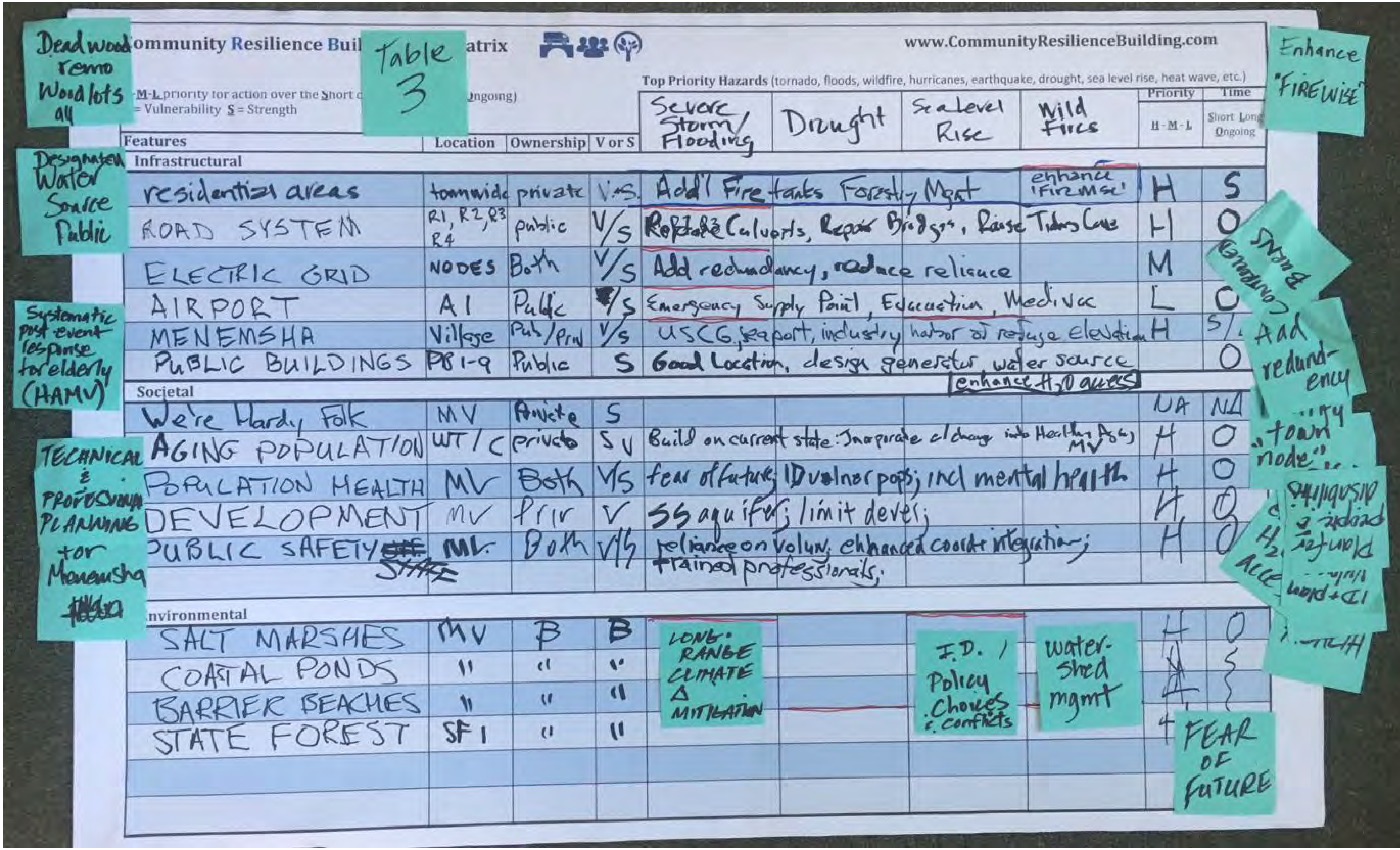
Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

H-M-L priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	EXTREME WIND EVENTS	EXTREME RAIN EVENTS	WILDFIRE	SEA-LEVEL RISE	Priority H-M-L	Time Short Long Ongoing
Infrastructural				LEGISLATIVE REDO					
STEAMSHIP	ISLAND VH + OB	STATE AUTHORITY	V+S	- SHIP DESIGN - MAINTENANCE - PLANNING + COORD.	INCREASE PUBLIC OVERSIGHT.		REBUILD PIERS	H	O
ROADS AND BRIDGES ~~FLOODING~~	TOWN WIDE	TOWN + PRIVATE STATE	V+S	TREE TRIMMING	IMPROVE CULVERTS + DRAINAGE		- RAISE BRIDGES - ENGINEERING - MAINTENANCE	L	O
ELECTRIC GRID	TOWN WIDE (EXCEPT CABLES)	EVERSOURCE + PRIVATE	V	- ~~TREE TRIMMING~~ - UNDERGROUNDING (SELECTIVE)	} SIMILAR	TREE TRIMMING? FIRE BREAKS		H	O
FUEL & FOOD DELIVERIES	ISLAND WIDE	PRIVATE	V	INCREASE FUEL STORAGE LOCAL FOOD PROD'N				H	O
MENEMSHA DOCK	MENEMSHA	PUBLIC PRIVATE	V				FLOATING DOCKS RAISE DOCKS ~~RETREAT?~~	L	L
Societal									
ISOLATION, ESP. ELDERLY	TOWN WIDE	PRIVATE	V	COMMUNITY-BASED PLAN + EDUCATION + OUTREACH → LONG-TERM RECOVERY PLAN				M	L
PUBLIC HEALTH	TOWN WIDE	PRIVATE PUBLIC	V	NEIGHBORHOOD-BASED INCREASED LOCAL CAPACITY				M	O
TICK-BOURNE DISEASES MOSQUITOES	"	"		TICK TESTING / DISEASE DETECTION EDUCATION;	BETTER DRAINAGE; DITCH MARSHES			M	S/O
EDUCATION ON RESILIENCE + SURVIVAL				HIRE RESILIENCE COORDINATOR, EDUCATOR, PLANNER				M	O
Environmental									
SALT MARSH HABITAT	COAST	PUBLIC + PRIVATE	V+S				ALLOW MIGRATION + RETREAT	L	L
WATER QUALITY - PONDS	PONDS	PUBLIC PRIVATE	V				DREDGE PONDS	M	O
WASTEWATER SYSTEMS	TOWN WIDE	PRIVATE	V		ADVANCED ENGINEERING INNOVATIVE/ALTERNATIVE			M	L
FOOD & AGRICULTURE	TOWN WIDE	PRIVATE	V+S	EXPAND RESILIENT CAPACITY → → GREENHOUSE, ABATOIR		DIVERSITY		M	O
				LEVERAGE CONSERVATION LANDS FOR AGRICULTURE AG. COMMISSION; RIGHT TO FARM BY-LAWS, ETC. CANNING, STORAGE					


GROUP 3
Group 3
AQUINNAH
CHILMARK
WEST TISBURY
TISBURY
OAK BLUFFS
Water Supply
SF1
A1
PB1
PB2
PB4
PB6
R1
R2
Chilmark and WestTisbury, MA
Dodson & Flinker
Landscape Architecture and Planning

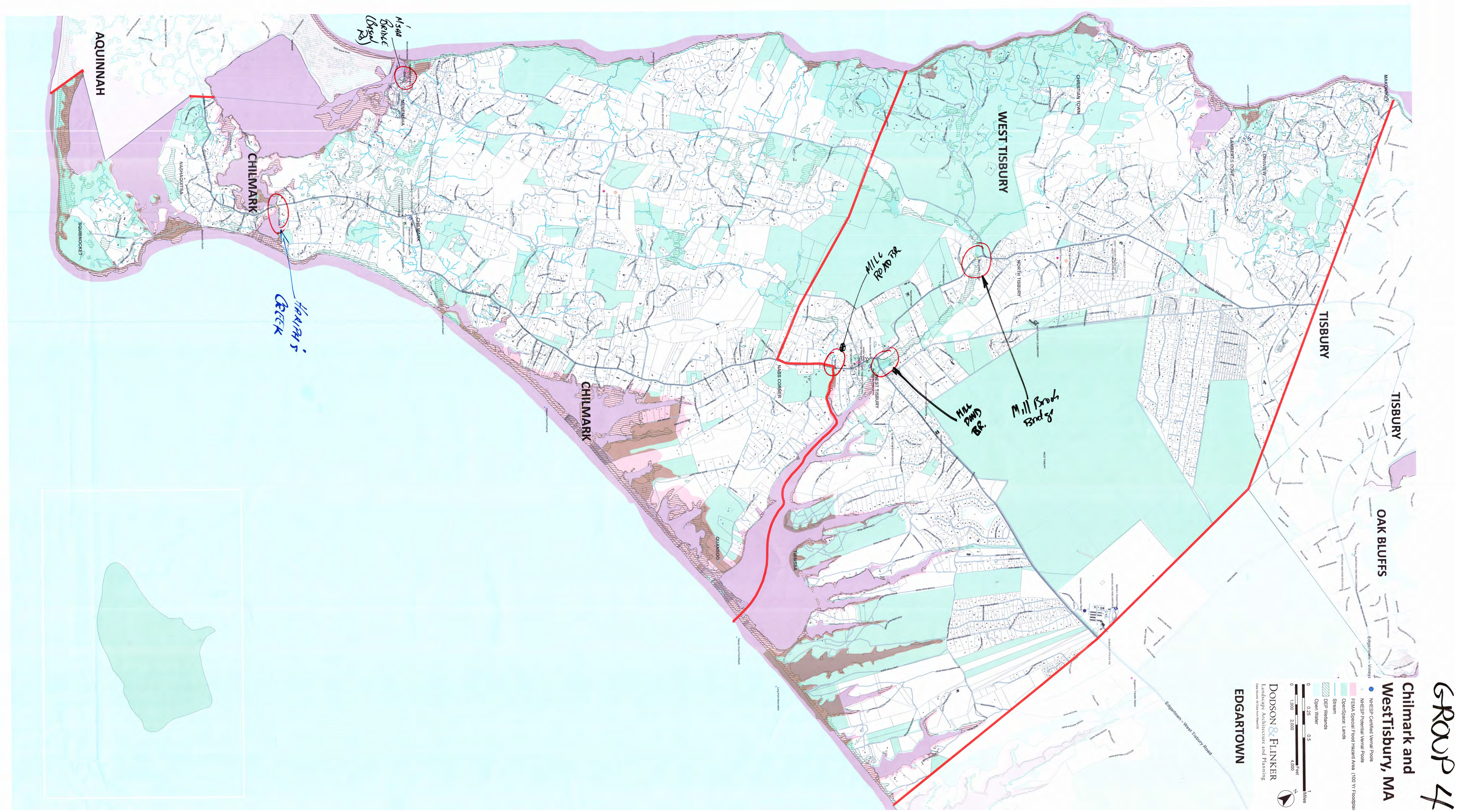


Community Resilience Building Workshop Risk Matrix — www.CommunityResilienceBuilding.com

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Severe Storm/Flooding	Drought	Sea Level Rise	Wild Fires	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
residential areas	townwide	private	V+S	Add'l Fire tanks Forestry Mgmt			enhance 'FireWise'	H	S
ROAD SYSTEM	R1, R2, R3 R4	public	V/S	Replace Culverts, Repair Bridges, Raise Tiders Cove				H	O
ELECTRIC GRID	NODES	Both	V/S	Add redundancy, reduce reliance				M	
AIRPORT	A1	Public	V/S	Emergency Supply Point, Education, Medivac				L	O
MENEMSHA	Village	Pub/Priv	V/S	USCG, seaport, industry, harbor of refuge elevation				H	S/L
PUBLIC BUILDINGS	PB 1-9	Public	S	Good Location, design generator, water source; enhance H_2O access					O
Societal									
We're Hardy Folk	MV	Private	S					NA	NA
AGING POPULATION	WT/C	private	S V	Build on current state: Incorporate cl change into Healthy Aging MV				H	O
POPULATION HEALTH	MV	Both	V/S	fear of future; ID vulner pops; incl mental health				H	O
DEVELOPMENT	MV	Priv	V	SS aquifer; limit devel;				H	O
PUBLIC SAFETY ~~STATE~~	MV	Both	V/S	reliance on volun; enhanced coord & integration; trained professionals;				H	O
Environmental									
SALT MARSHES	MV	B	B					H	O
COASTAL PONDS	"	"	"					H	S
BARRIER BEACHES	"	"	"					H	S
STATE FOREST	SF1	"	"					H	



GROUP 4
Chilmark and West Tisbury, MA
AQUINNAH
CHILMARK
WEST TISBURY
TISBURY
OAK BLUFFS
EDGARTOWN
MILL ROAD BR
Mill Brook Bridge
DODSON & FLINKER
Landscape Architecture and Planning

Community Resilience Building Risk Matrix

TABLE 4

www.CommunityResilienceBuilding.com

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	SEA LEVEL RISE	FIRE / Drought	Flooding / STORMS	[illegible]	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
ACCESS TO HEALTH SERVICES EMS/VISITING NURSES/MEALS on wheels (Emerg.) (Hospital too)	TOWN WIDE		V/S	✓		people at risk get beepers		H	S
Fuel Supply / Access to Fuel			V	✓		increase storage		H	S
WATER supply	INDIVIDUAL	PRIVATE	V	✓				L	O
FERRY	specific	STATE	V	✓ Rebuild/relocate				H	L
communication ctr, by airport						implement, support the "microgrid" plan			
Dependence on Businesses in other towns for food, supplies				✓					
Marsh's Creek Bridge Mill pond DAM	specific specialc								O
Mill Brook Bridge — Future development	COASTAL	P+P	V	ZONING FOR S.L.R.		ZONING FOR INUNDATION		H	L
Societal TRASH/Recycle/COMPOST	Island wide	local gov't	V	✓START COMPOSTING,	Recycling FACILITY,	TRASH-TO-ENERGY on ISLAND, AS APPROPRIATE		H	O
elders (Isolated)	Island-wide	Private	V	COMMUNICATION,	TRANSPORTATION,	SUPPLIES		H	O
COMPARTMENTALIZED decision-making Across Island (shared geography)		(County) 6TOWNS	V/S	✓SHARED VISIONING	ACROSS TOWNS	(Shared Problems)		H	O
Farmers (crops, livestock)	TOWN wide	Private	V/S	MOBILE SLAUGHTER FACILITY	✓ASSIST W. WATER STORAGE	✓PRE-STORM BLEMISH PROGRAM		L	O
People who depend on Routine Medical Care (dialysis, etc)	town wide				✓A/C FOR School Gyms in HEAT WAVE Sheltering Scenario	Priority list for HOME CARE, AT HOSPITAL		H	O
Fisherman						FILTER RUNOFF (shellfish)			
TOURISM									
Environmental									
Dunes/Shorelines/Beaches	COASTAL	Public + Private	V/S	✓BENCHMARKS FOR STORM + SLR LEVELS (AWARENESS)		✓		H	O
Ponds/wetlands/Harbor	town wide	P + P		✓UPGRADE Septic Technology		ENVIRONMENTAL MONITORINGS	NO CHEM. FERTILIZER OR HERBICIDES	H	S/O
AQUIFER	town COASTAL wide	P+P		✓RELOCATION ASSISTANCE OR wells FOR COASTAL dwellers				L	O
Forest (Age, structure)		Public + Private	V		Firebreaks		Forest MGMT. Wild life MGT	H	O
AIR QUALITY?									

Public Health / Vector Born Disease

APPENDIX B: COMPILED MATRIX

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

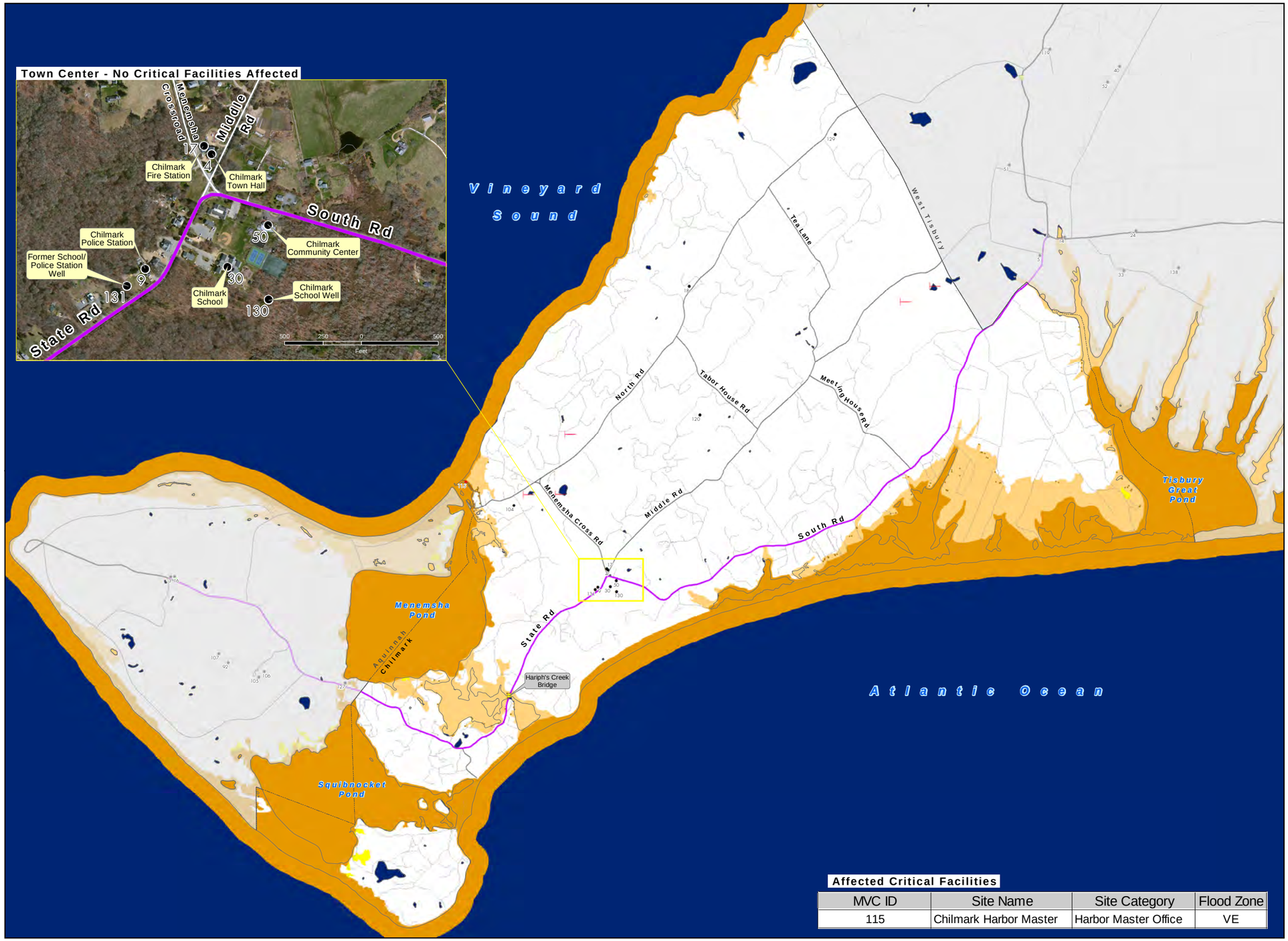
H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Sea Level Rise	Hurricanes and Storms (flooding, wind)	Wildfire and Drought	Ecological Change, Vector Borne Disease	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Reliance on Ferry System	Tisbury, Oak Bluffs	State	V	Ferry piers and bridge rebuilt to accommodate sea level rise	Improve/modernize Ferry System, planning and coordination; "legislative redo"			H	L
Airport	Specific	Public	S		Reinforce Airport's role as emergency supply point, evacuation, medivac			L	O
Public Buildings	Specific	Public	V/S		Ensure public buildings have backup generators and a water source			L	O
Schools	Specific	Public/Private	V		Backup generator for Chilmark School			L	L
Menemsha	Chilmark	Public/Private	V	Professional and Technical Planning for Menemsha; floating docks?				M	L
Menemsha Water Supply	Chilmark	Public	V			HMP: "Install 8000 gallon holding tank for Menemsha public water supply"		M	S
Menemsha Parking Lot	Chilmark		V		HMP: "Rehabilitate Menemsha parking lot drainage"			L	S
Stormwater infrastructure	Townwide	Public	V/S		HMP: "Reduce damaging volume of direct stormwater discharges to beaches and surface waters by infiltration of those segments of the systems where infiltration is possible back in the watershed, particularly in the vicinity of Menemsha"			M	L
Electric Grid and Internet	Townwide	Eversource and Private	V		Selective undergrounding of most-vulnerable wires, grid modernization; More solar microgrids; Reduce reliance on grid, add redundancy			H	L
Water Supply In State Forest	Specific	Town	V			HMP: "In order to reduce the impacts of drought and wildfire, install new public water supplies and water supply lines within the State Forest"		M	L
Water supply	Townwide	Private	V		Electric backup for pumping water wells/ hand pumps	Designated public water source; HMP: "Consider potential need for and options to provide water supply to areas with a development pattern that may not be compatible with continued private well water supplies, which may not be adequate in the event of emergencies such as drought and wildfire; build the necessary infrastructure"		M	L
Water supply for general firefighting	Townwide	Public/Private	V			HMP: "Install dry hydrants to pump pond water for firefighting. Required for some new subdivisions. Encourage elsewhere. If there is no pond nearby, install a water source."		M	L
Food Supply	Townwide	Public/Private	V		Increase local food production and storage			H	O
Fuel Supply	Specific	Private	V		Increase fuel storage capacity			L	S
Mill Pond Dam	Specific	Town	V		HMP: "The brush on the upstream and downstream faces should be cut yearly and the condition of the spillway planks should be determined and replaced if necessary (annual cost $2000). Areas of potential erosion from road runoff should be protected with asphalt aprons. A simple static and seismic stability analysis of the dam should be done (cost about $5000). An operation and maintenance manual should be developed. An emergency action plan for an alternative travel route should be prepared by the West Tisbury Emergency Planning Group. New- consider options such as dredging."			M	S

Priester's Pond Dam	Specific	Town	V		HMP: "The pond level should be recorded continuously so that water flow and spillway capacity can be measured after every major storm event. An operation and maintenance manual should be developed. The brush on the entire dam should be cut yearly and the condition of the spillway and the masonry wall on the upstream face be determined and repairs made as necessary."			M	S
Looks Pond Dam	Specific	Town	V		HMP: "All saplings, vines and trees located on any part of the dam should be cut and removed from the site, especially near the primary and auxiliary spillways (the roots will rupture or crack the adjacent cement concrete). General or standard Dam Engineering practice calls for a tree-clear area extending 10 feet from the dam; Replace stoplogs within the anciliary spillway."			M	S/O
Coastal District overlay regulations	Coastal	Town	S	Review and possibly amend Coastal District and other overlay regulations for hazard mitigation				M	S
Residential Areas	Townwide	Private	V/S			Additional fire tanks, forestry management, enhance "Firewise"		H	S
Subdivision Regulations	Townwide	Public/Private	V/S		HMP: "Use town regulations to prevent subdivision covenants from restricting homeowners from using fire-wise roofing materials such as asphalt" "Update subdivision regulations to keep drainage from private roads from flowing onto South Rd" "Review and possibly revise local subdivision regulations for stormwater management to lessen the impacts of flooding" "Hold informational sessions with town boards to encourage the incorporation of Low Impact Development Techniques in local subdivision regulations"			M	S
Wastewater	Townwide	Public/Private	V		Upgrade septic technology				
Stormwater collection areas and discharges	Townwide	Public/Private	V/S		Map stormwater collection areas and discharges			M	S
Tiah's Cove Rd	Specific	Public/Provate	V		Raise parts of Tiah's Cove Rd			H	O
South Road	Specific	Town	V		HMP: "Establish South Rd as a critical facility from town line to town line and prioritize its storm protection and adaptation to rising sea level. Protect and possibly elevate the bridge adjacent to Stonewall." "Rehabilitate South Road stormwater drainage"			M	S
Roads	Townwide	Public/Private	V	Retreating/elevating/prote	HMP: "Reduce flood impacts by identifying and correcting discharges from Town and Commonwealth roadways where they cross streams, including: Mill Brook (West Tisbury and Chilmark portions), Tiasquam (Chilmark portion), Fulling Mill Brook, Paint Mill Brook, Roaring Brook, Turtle Brook, 2 unnamed stream crossings in the Great Rock Bight area, Black Brook (West Tisbury), Witch Brook (West Tisbury), andunnamed stream flowing along portion of North Road that extends from Menemsha Cross Road to Menemsha Village. The road surface at each crossing should be adjusted during repaving to divert as much runoff as possible into roadside vegetation before it reaches the road crossing." "Work with the Joint Transportation Committee to make long-range plans for public roads vulnerable to Sea Level Rise"	Widening and improvements to fire roads		M	S
Societal									
Elderly population	Townwide	Private	V		Communication and transportation for pre-identified isolated elders as part of hazard response (already exists?). Incorporate climate change into Healthy Aging MV; In-house elder services; community-based plan and education and outreach; long term recovery plan, neighborhood-based			H	S/O
Lyme and other vector borne diseases	Townwide	Public/Private	V				Obtain tick disease detecting equipment	H	S
Public Education				Hire resilience coordinator and educator; educate coastal landowners about shoreline management, and public about usage				H	S

Medical Care	Townwide	Private	V		Improve communication infrastructure resilience			H	L
Homeless Population	Townwide	Public (day) / Private (night)			Warming shelter			L	L
Development	Townwide	Private	V	Protect aquifer, limit development				H	O
Public Safety	Townwide	Public/Private	V/S	Reliance on volunteers; enhanced coordination and integration; trained professionals				H	O
Environmental									
Forests	Townwide	Public/private	V/S			Forest fuel reduction, dead wood removal, planning for wildfire, fire breaks. HMP: "In order to reduce the impacts of drought and wildfire, establish an overall management plan for the State Forest, including establishment of specific procedures or Memoranda of Agreement regarding the transfer of land for new public water supplies and for easements to install water supply lines"	Coordinate forest and wildlife management	H	S/O
Ponds, wetlands, harbors	Townwide	Public/private	V/S		Protection from erosion, water quality. Culvert replacement (as needed). Use environmental moorings. HMP: "Reduce flood impacts by identifying stormwater systems that have potential to discharge hazardous materials in the event of a storm or flood and installing an emergency shut-off system in each of those systems"		No chemical fertilizer or herbicides	M	O
Streams	Specific	Public/private	V		Culvert Replacements			L	S
Coastal lands (in general)	Coastal	Public/private	V/S	Benchmarks in visible locations showing high water marks, to build awareness about sea level rise and storm surges				M	S
Beaches	Townwide	Public/private	V/S	Allow retreat	HMP: "Beach Nourishment and dredging and structural reconfiguration of inlets and inlet protections to improve natural defenses and circulation, in order to minimize storm impacts (appropriateness to be determined by Board of Selectmen on a case-by-case basis); vegetation management for dune restoration"			M	O
Aquifers	Townwide	Private	V/S	Assistance for homeowners to relocate wells as needed				L	O
Salt marsh habitat	Coast	Public/private	V/S	Allow retreat				M	O
Food & Agriculture	Townwide	Private	S	Expand capacity, diversity, greenhouse, abatoir. Leverage conservation land for agriculture, ag commission; right to farm bylaws, etc; canning storage				M	O



Affected Critical Facilities

MVC ID	Site Name	Site Category	Flood Zone
115	Chilmark Harbor Master	Harbor Master Office	VE

100 & 500 Year Flood Map

Chilmark, MA

Pre-Disaster Mitigation Plan

- Affected Structures
- Bridges
- Dams
  - Low to Moderate Hazard
- Critical Facilities
  - Affected
  - Not Affected
- Flood Zones*
  - 100 Year (VE Zone)
  - 100 Year (AE Zone)
  - 500 Year Zone
- Roads
  - Primary Road
  - Secondary Road
  - Tertiary Road
  - Critical Road Segment
- Town Boundary

*Data provided by FEMA - Preliminary DFIRM June 2013

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.

The 100 year & 500 year flood 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 developed by FEMA to support floodplain management and planning activities but do not replace the official paper FIRMs. These data are not suitable for engineering applications or site work nor can the data be used to determine absolute delineations of flood boundaries. Instead the data should be used to portray zones of uncertainty and possible risks associated with flooding. These data do not replace the paper FIRMs which remain the official documents.

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, 8/26/13, ph. 508-693-3453, www.mvcommission.org
Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastructure - MEMA 2006 & MVC 2013; Flood Data - Preliminary dFIRM FEMA June 2013; 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_dFIRM_prelim_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

100 & 500 Year Flood Map

West Tisbury, MA

Pre-Disaster Mitigation Plan

Critical Facilities
None Within 100 & 500 Year Flood Zones

MVC ID	Site Name	Site Category
5	West Tisbury Town Hall	Town Hall
23	West Tisbury Fire Department - State Rd	Fire Department
23	West Tisbury Fire Department - State Rd	Primary Emergency Operations Center
23	West Tisbury Police Department - State Rd	Police Station
24	West Tisbury Fire Department - Edgartown Rd	Alternate Emergency Operations Center
24	West Tisbury Fire Department - Edgartown Rd	Fire Department
33	Island Montessori School	School
34	Martha's Vineyard Public Charter School	School
40	West Tisbury Elementary	MassCare Center
40	West Tisbury Elementary	School
51	Martha's Vineyard Agricultural Hall	MassCare Center
52	Island Children's School	DayCare Center
58	Cynthia Aguilar's Day Care	DayCare Center
68	Laura L. Entner's Day Care	DayCare Center
79	Martha's Vineyard Airport	Airport
85	Dr. Michele Jasny	Vet/Animal Shelter
86	Animal Health Care Associates	Vet/Animal Shelter
91	Dukes County Wastewater Treatment Plant	Wastewater Treatment Plant
119	W.Tisbury DPW Eqipment	Public Works Equipment Storage
135	Salon, Nancy	DayCare Center
138	Conover, Veronica	DayCare Center
149	Mill Pond Dam	Dam

- Affected Structures
- Bridges
- Transmission Lines
- Critical Road Segment

Critical Facilities
- Affected
- Not Affected

Flood Zones*
- 100 Year (VE Zone)
- 100 Year (AE Zone)
- 500 Year Zone

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

Town Boundary

*Data provided by FEMA - Preliminary DFIRM June 2013

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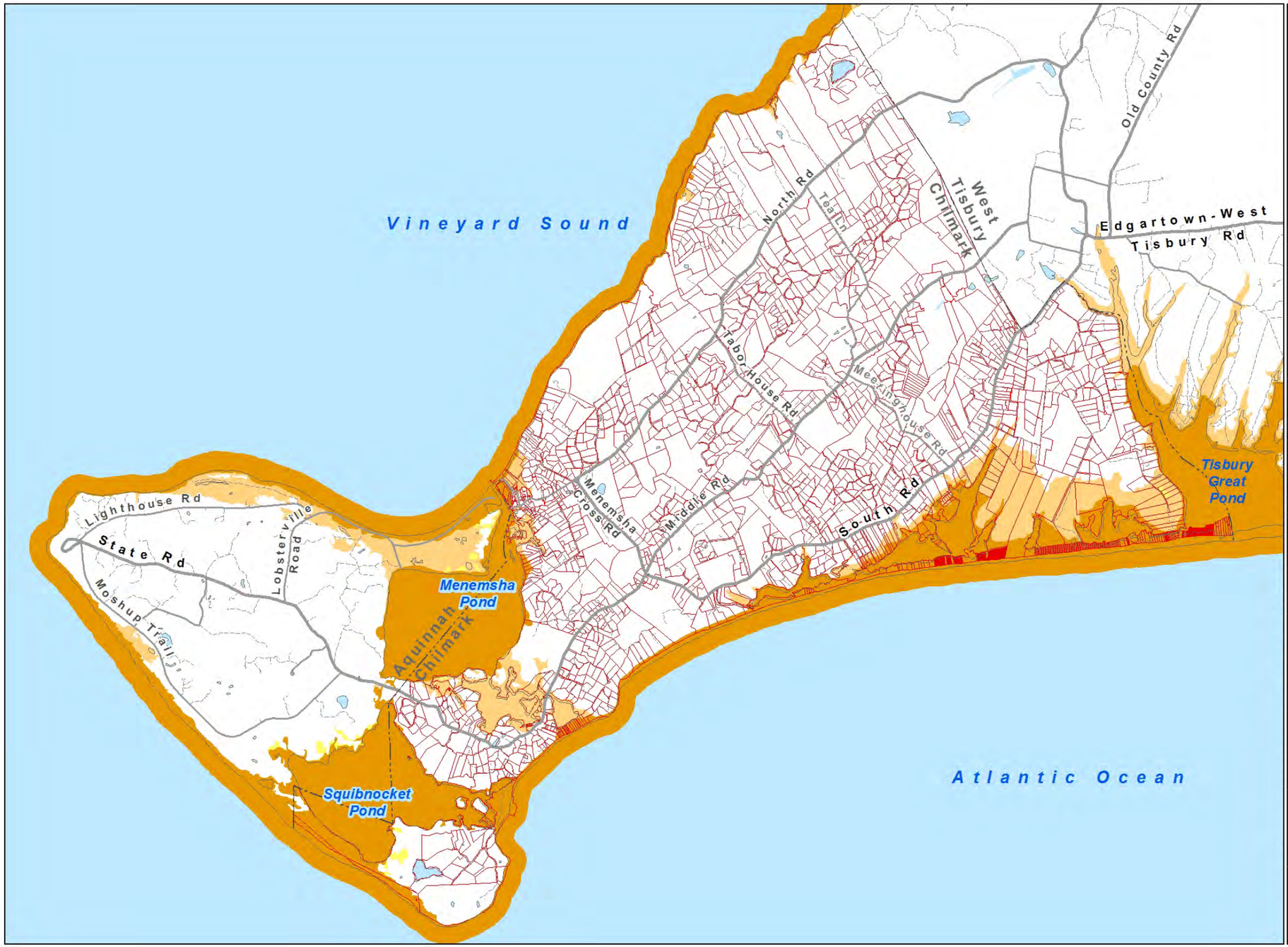
Projection: Stateplane, MA Mainland, NAD83, Meters
File: cls_pdm; Vhl_dFIRM_prelim_2013.mxd - Original in color

500 250 0 500 1000 Meters

0.5 0 0.5 1 Miles



Effective Flood Boundaries Chilmark, MA

These flood boundaries are the most recent delineations adopted by the Town in 2016. FEMA regards these data as 'effective' as of July 2016.

Parcel Boundary
Land

Flood Zones
100 Year (VE Zone)
100 Year (AE Zone)
500 Year Zone

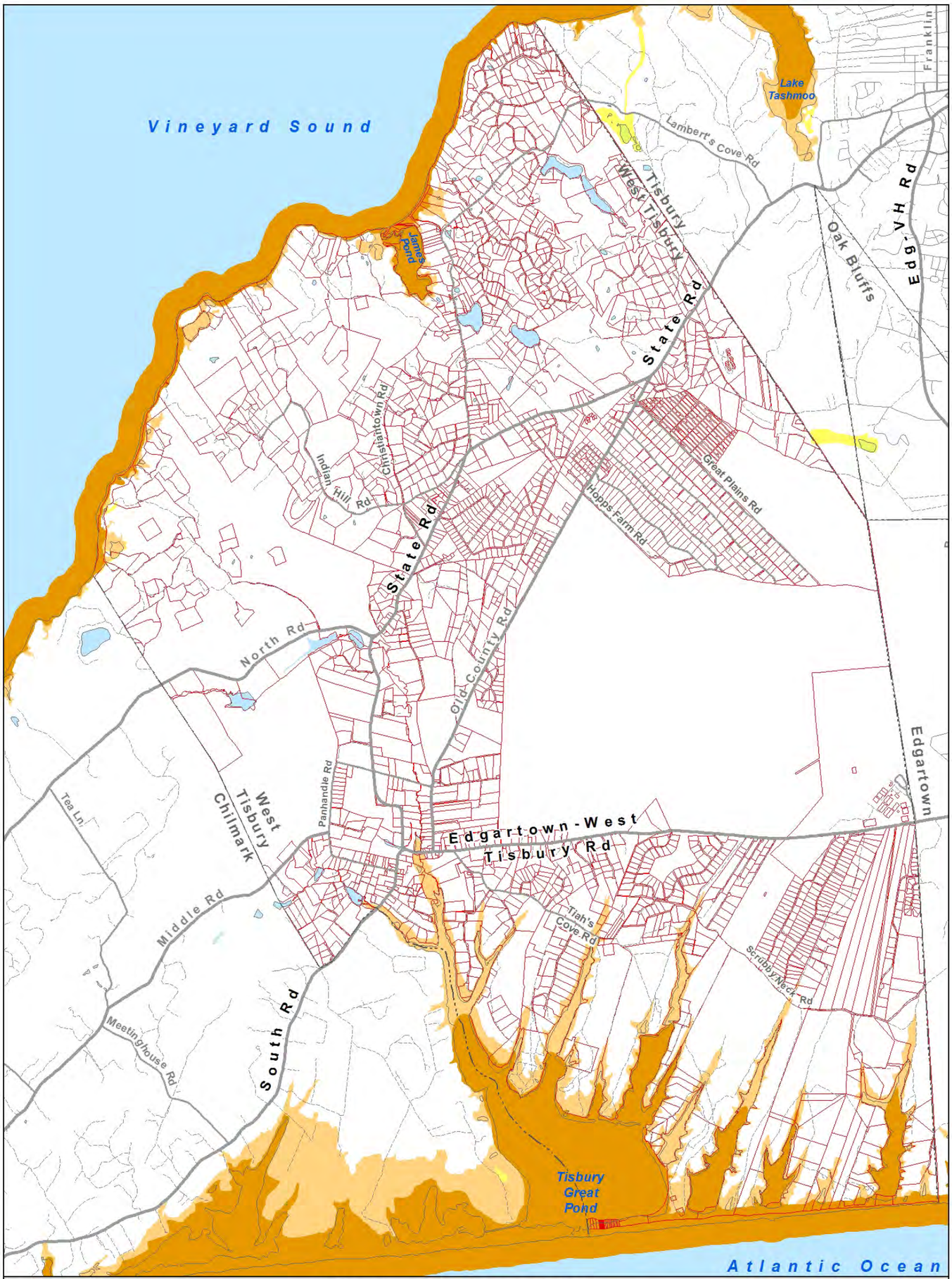
NOTES:
The 100 year & 500 year flood areas represent a subset of the data available on the paper Flood Insurance Rate Maps -FIRM as provided by the Federal Emergency Management Agency (FEMA). These data were developed by FEMA to support floodplain management and planning activities but do not replace the official paper FIRMs. These data are not suitable for engineering applications or site work nor can the data be used to determine absolute delineations of flood boundaries. Instead the data should be used to portray zones of uncertainty and possible risks associated with flooding. These data do not replace the paper FIRMs which remain the official documents.

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, 9/15/16, ph. 508-693-3453, www.mvcommission.org
Data: Flood Boundaries - FEMA Effective 2016; Roads - MassDOT/MassGIS 2014; Parcels - Cartographic Assoc - FY2016
Projection: Stateplane, MA Mainland, NAD83, m
File: cls_basics; chi_effFlood_par_2016.mxd
Original in color

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

MARTHA'S VINEYARD COMMISSION
MASS GIS



Land
Parcel Boundary

Flood Zones
100 Year (VE Zone)
100 Year (AE Zone)
500 Year Zone

DISCLAIMER:
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Effective Flood Boundaries
West Tisbury, MA

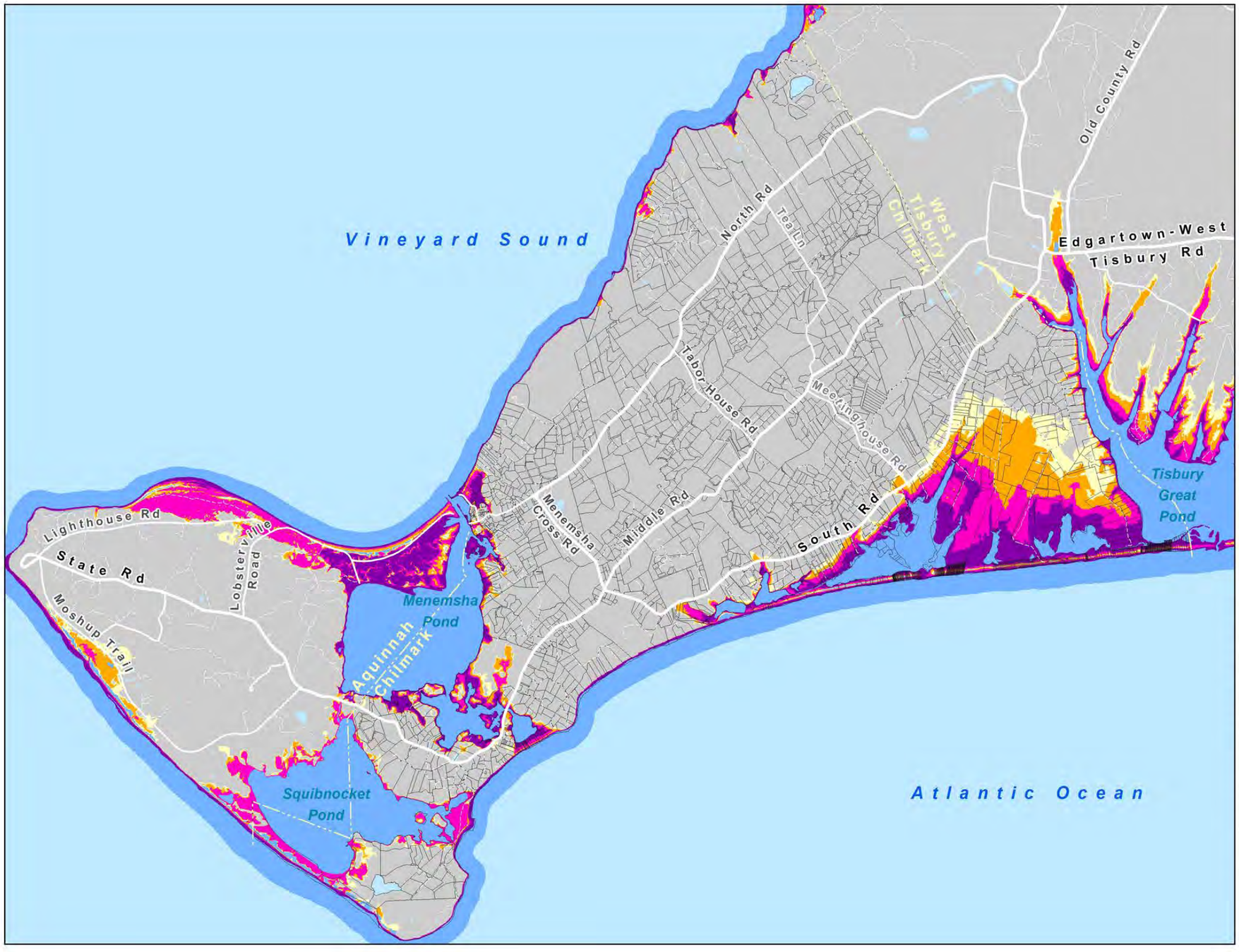
These flood boundaries are the most recent delineations adopted by the Town in 2016. FEMA regards these data as 'effective' as of July 2016.

0.5 0.25 0 0.5 1 Miles

N

NOTES:
The 100 year & 500 year flood 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 developed by FEMA to support floodplain management and planning activities but do not replace the official paper FIRMs. These data are not suitable for engineering applications or site work nor can the data be used to determine absolute delineations of flood boundaries. Instead the data should be used to portray zones of uncertainty and possible risks associated with flooding. These data do not replace the paper FIRMs which remain the official documents.

Compiled By: Martha's Vineyard Commission, CL Seidel, 9/15/16, ph. 508-693-3453, www.mvcommission.org
Data: Flood Boundaries - FEMA Effective 2016; Roads - MassDOT/MassGIS 2014; Parcels - Cartographic Assoc - FY2017
Projection: Stateplane, MA Mainland, NAD83, m; File: cls_basics; wti_effFlood_par_2016.mxd - Original in color



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 with MassGIS Digital Terrain Model (DTM) files which were made available in April 2003.

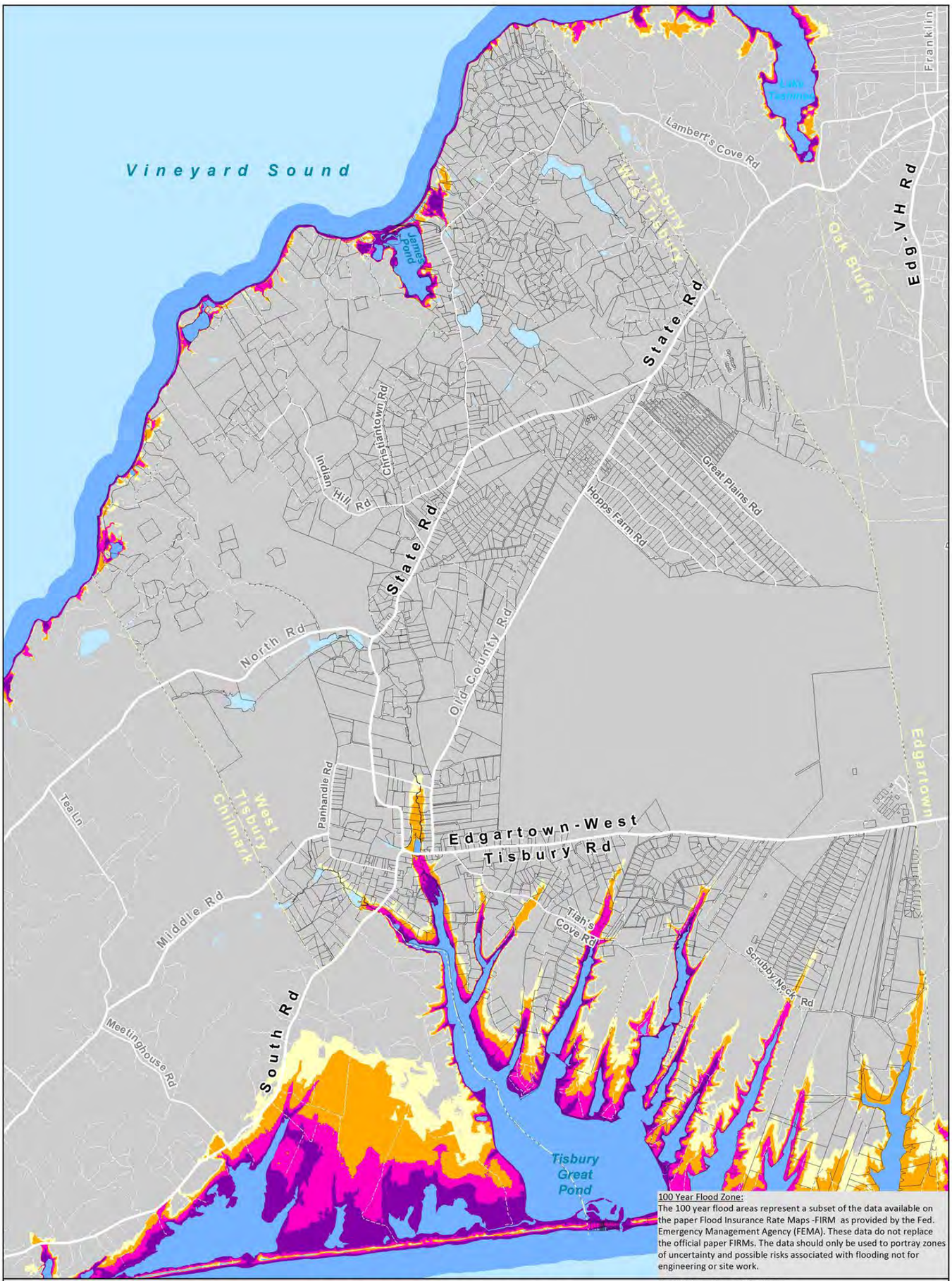
Elevation Accuracy:
SLOSH Model Elevation Data: +/- 20 percent
LiDAR Elevation Data: +/- 0.5ft vertical; +/-1ft horiz.

100 Year Flood Zone:
The 100 year flood 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,
CL Seidel, 1/27/16, 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: cls_basics; chi_Hurr_Inundation_par.mxd - Original in color

0.5 0.25 0 0.5 1
Miles
N



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

Hurricane Surge Inundation
West Tisbury, MA

0.5 0.25 N 0 0.5
Miles

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, CL Seidel, 1/27/16, 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. 2014
Projection: Stateplane, MA Mainland, NAD83, m; File: cls_basics; wti_Hurr_Inundation_par.mxd; Orig. in color

100 Year Flood Zone:
The 100 year flood areas represent a subset of the data available on the paper Flood Insurance Rate Maps -FIRM as provided by the Fed. Emergency Management Agency (FEMA). These data 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.

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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.

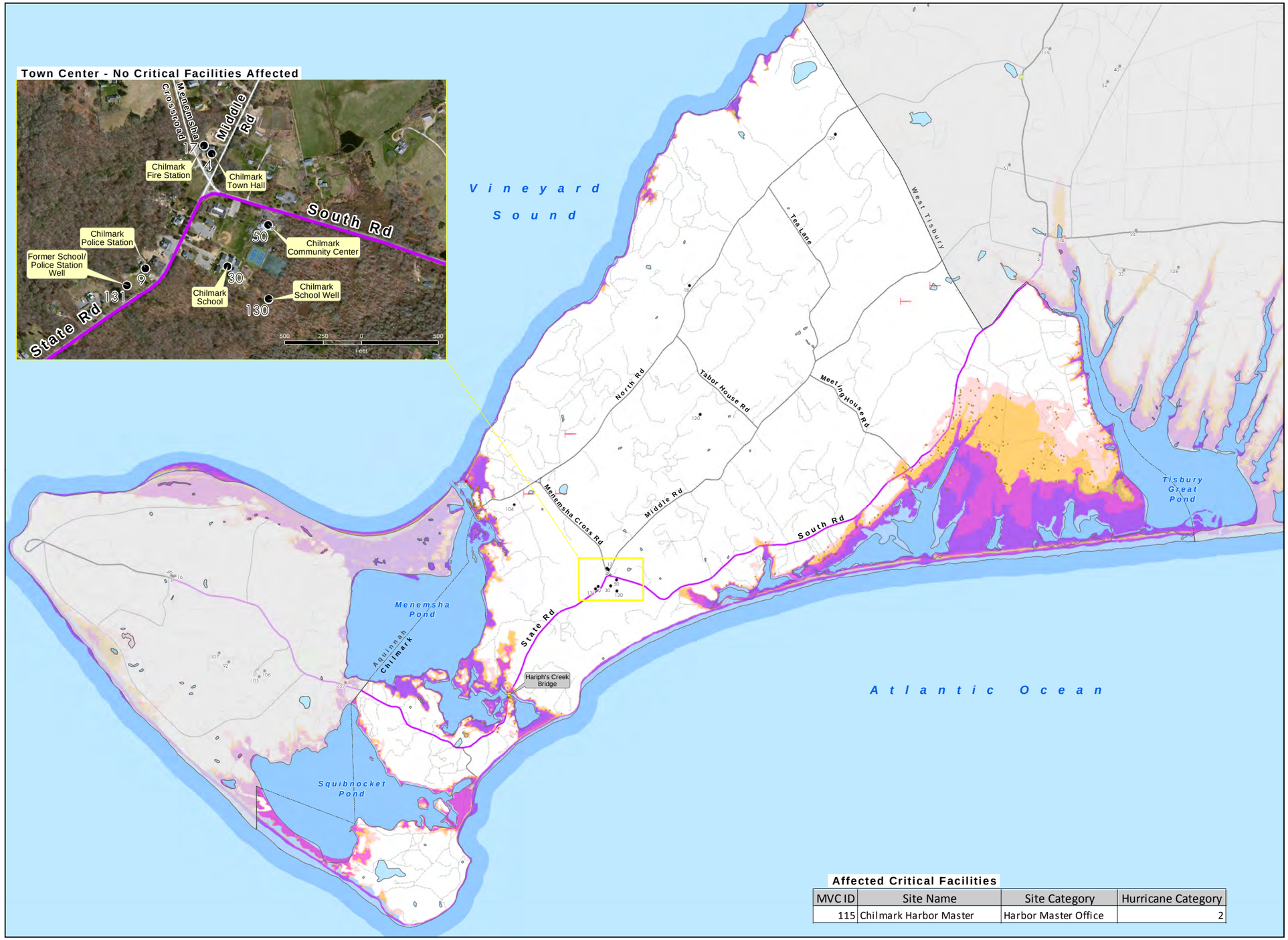
The hurricane surge inundation areas shown on this map depict the inundation that can be expected to result from a worst case combination of hurricane landfall location, forward speed, and direction for each hurricane category.

The primary elevation data source was LiDAR data collected from Nov 2009 to Feb 2010 by CampDresser and McKee. This data was supplimented with MassGIS Digital Terrain Model (DTM) files (of 2003)

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

Hurricane Surge Inundation and Hurricane Tracks
Chilmark, MA

Pre-Disaster Mitigation Plan



- Affected Structures
- Bridges
- Dams
  - Low to Moderate Hazard
- Critical Facilities
  - Affected
  - Not Affected
- FEMA 100 Year Flood Zone*
- Hurricane Surge Inundation (Flooding)
  Worst Case Scenario
  - Category 1
  - Category 2
  - Category 3
  - Category 4
- Roads
  - Primary Road
  - Secondary Road
  - Tertiary Road
  - Critical Road Segment
- Town Boundary

*Data provided by FEMA - Preliminary DFIRM June 2013

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.

Per USACE:
"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 with MassGIS Digital Terrain Model (DTM) files which were made available in April 2003."

ACCURACY:
SLOSH Model Elevation Data: +/-20 percent
LiDAR Elevation Data: +/- 0.5ft vertical; +/-1ft horizonatal
Shoreline Data: Less accurate than LiDAR; Hence, discrepancies will be visibly noticable when displayed together.

DISCLAIMER:
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Compiled By: Martha's Vineyard Commission, CL Seidel, 8/27/13, ph. 508-693-3453, www.mvcommission.org

Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastucture - MEMA 2006 and MVC 2013; Inundation Areas - USACE 2013; Hurricane Track - NOAA; Flood Zone - FEMA Preliminary June 2013
Projection: Stateplane, MA Mainland, NAD83, Meters
File: cls_pdm; Chi_HurSLOSH_2013_v2.mxd - Original in color

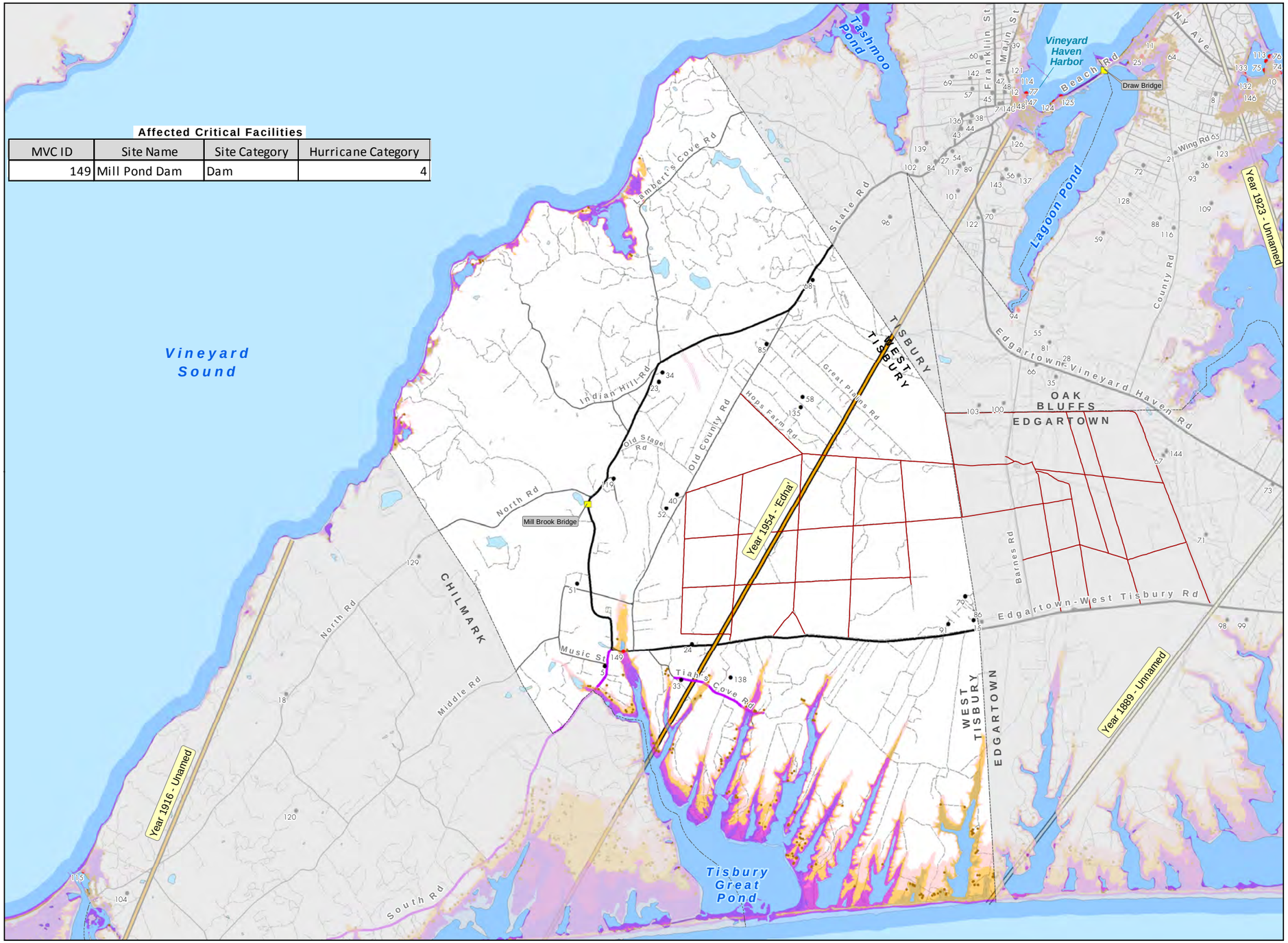
0.5 0.25 0 0.5 1
Kilometers
0.25 0.125 0 0.25 0.5
Miles
N

Affected Critical Facilities

MVC ID	Site Name	Site Category	Hurricane Category
115	Chilmark Harbor Master	Harbor Master Office	2

Affected Critical Facilities

MVC ID	Site Name	Site Category	Hurricane Category
149	Mill Pond Dam	Dam	4



Hurricane Surge Inundation and Hurricane Tracks
West Tisbury, MA
Pre-Disaster Mitigation Plan

- Affected Structures
- Bridges
- Transmission Lines
- Critical Road Segment

Critical Facilities
- Affected
- Not Affected

- FEMA 100 Year Flood Zone*

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

Hurricane Track
- TS - Tropical Storm (39-73 MPH)
- H1 - Category 1 (74-95 MPH)
- H2 - Category 2 (96-110 MPH)

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

Town Boundary

*Data provided by FEMA - Preliminary DFIRM June 2013

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.

Per USACE:
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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."

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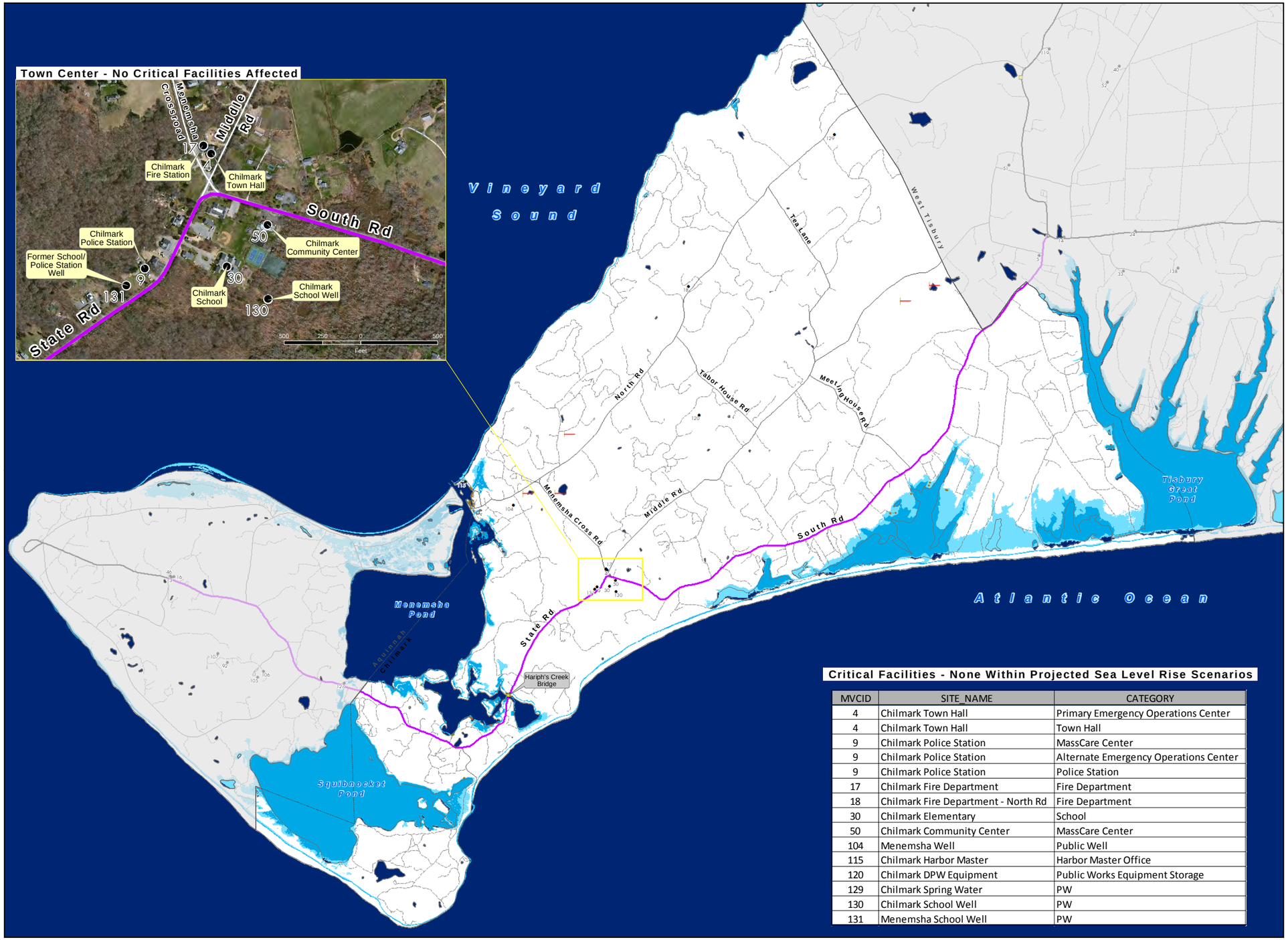
Compiled By: Martha's Vineyard Commission, CL Seidel, 3/4/14, ph. 508-693-3453, www.mvcommission.org

Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastructure - MEMA 2006 and MVC 2014; Inundation Areas - USACE 2013; Hurricane Track - NOAA; Flood Zone - FEMA Preliminary June 2013
Projection: Stateplane, MA Mainland, NAD83, Meters
File: ck_pdm; Wt_HurSLOSH_2013_v2.mxd - Original in color

500 250 0 500 1000 Meters
0.5 0 0.5 1 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

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 PreDisaster 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 1.06ft greater than NAVD88.

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

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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

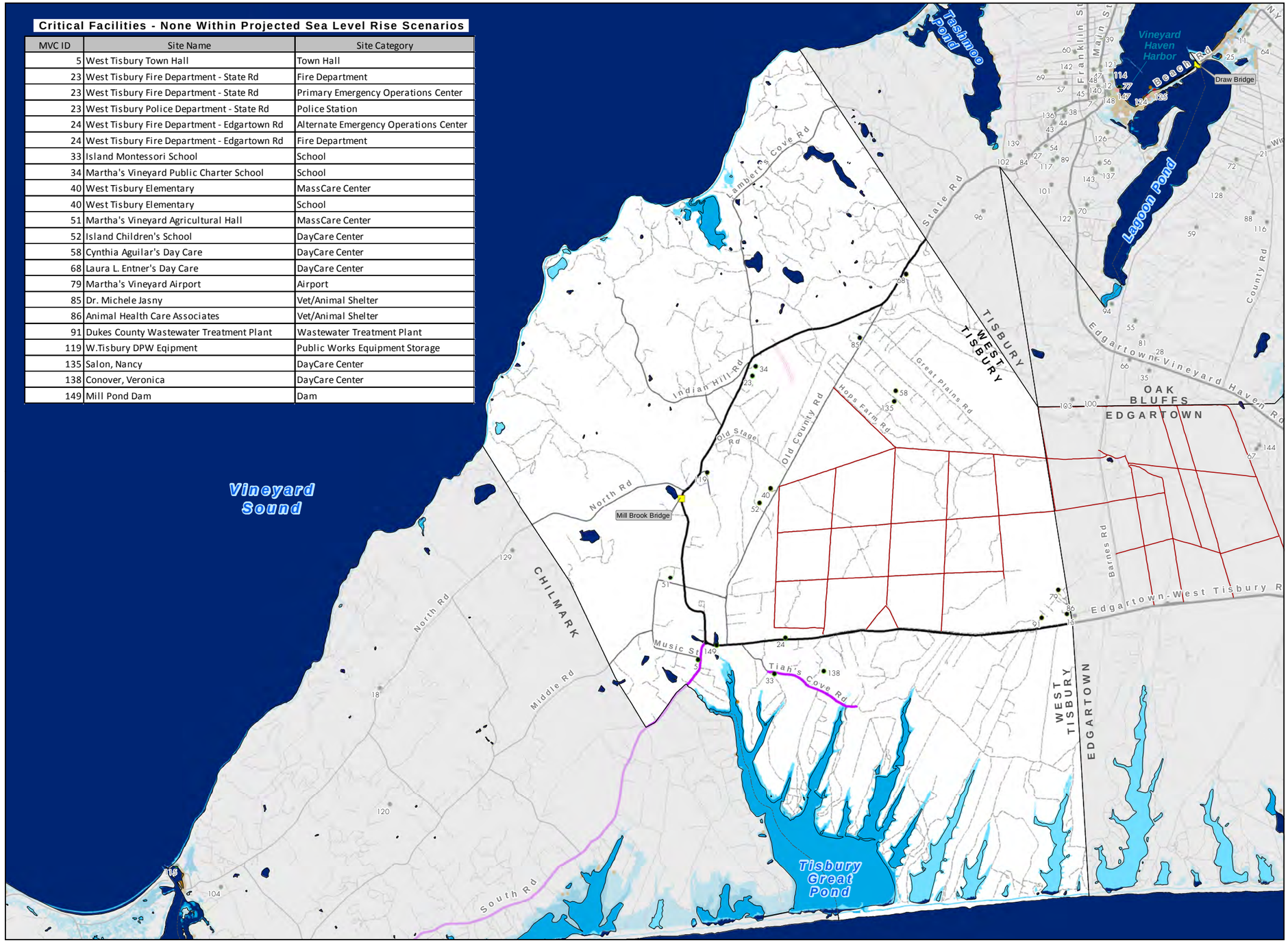
N

MARTHA'S VINEYARD COMMISSION

MASS GIS

Critical Facilities - None Within Projected Sea Level Rise Scenarios

MVC ID	Site Name	Site Category
5	West Tisbury Town Hall	Town Hall
23	West Tisbury Fire Department - State Rd	Fire Department
23	West Tisbury Fire Department - State Rd	Primary Emergency Operations Center
23	West Tisbury Police Department - State Rd	Police Station
24	West Tisbury Fire Department - Edgartown Rd	Alternate Emergency Operations Center
24	West Tisbury Fire Department - Edgartown Rd	Fire Department
33	Island Montessori School	School
34	Martha's Vineyard Public Charter School	School
40	West Tisbury Elementary	MassCare Center
40	West Tisbury Elementary	School
51	Martha's Vineyard Agricultural Hall	MassCare Center
52	Island Children's School	DayCare Center
58	Cynthia Aguilar's Day Care	DayCare Center
68	Laura L. Entner's Day Care	DayCare Center
79	Martha's Vineyard Airport	Airport
85	Dr. Michele Jasny	Vet/Animal Shelter
86	Animal Health Care Associates	Vet/Animal Shelter
91	Dukes County Wastewater Treatment Plant	Wastewater Treatment Plant
119	W.Tisbury DPW Eqipment	Public Works Equipment Storage
135	Salon, Nancy	DayCare Center
138	Conover, Veronica	DayCare Center
149	Mill Pond Dam	Dam



Sea Level Rise Projection

based on 2010 LiDAR elevation data & accounting for MHHW

West Tisbury, 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
- Transmission Lines
- Critical Road Segment

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
- Fire Lane

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

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Compiled By: Martha's Vineyard Commission, CL Seidel, 3/4/14, ph. 508-693-3453, www.mvcommission.org
Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastructure - MEMA 2006 & MVC 2014; Fire Lane - MVC 2005; LiDAR Elevation Data - FEMA 2010 & MassGIS 2012; Structures - MassGIS 2013 release from 2011 aerial photos
Projection: Stateplane, MA Mainland, NAD83, Meters
File: cls_pdm; Wtt_SeaLevel_MHHW_2013.mxd - Original in color

500 250 0 500 1000 Meters

0.5 0 0.5 1 Miles

N

MARTHA'S VINEYARD COMMISSION

MASS GIS

Wildland Urban Interface

Chilmark, MA

Pre-Disaster Mitigation Plan

Town Center - No Critical Facilities Affected

Vineyard Sound

Tisbury Great Pond

Menemsha Pond

Aquinnah Chilmark

Squibnocket Pond

Hariph's Creek Bridge

Atlantic Ocean

West Tisbury

Tea Lane

North Rd

Tabor House Rd

Meeting House Rd

Middle Rd

Menemsha Cross Rd

South Rd

State Rd

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.

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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 2005
Projection: Stateplane, MA Mainland, NAD83, Meters
File: cls_pdm; Chi_WildFire_2013.mxd - Original in color

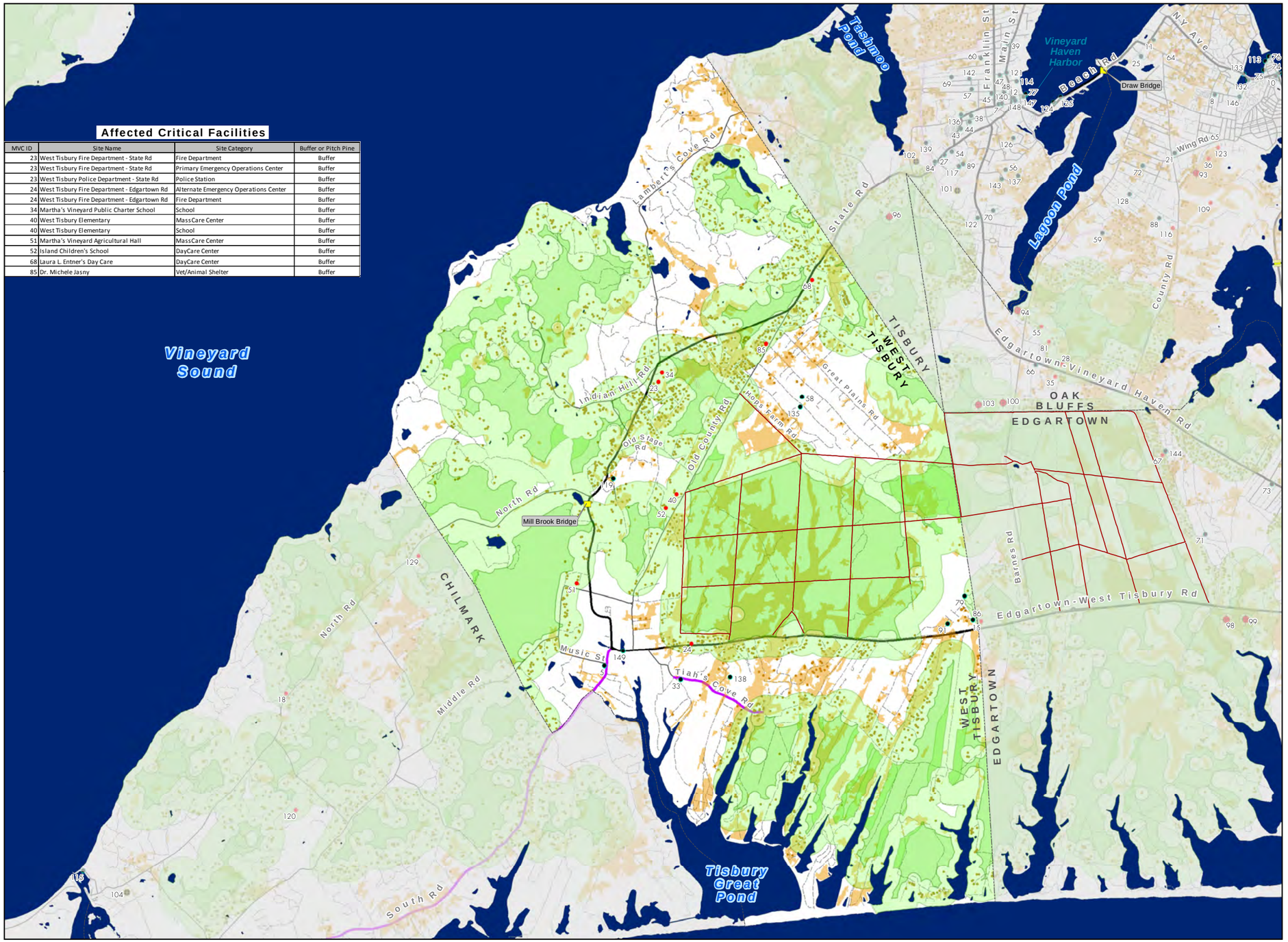
0.5 0.25 0 0.5 1
Kilometers
0.25 0.125 0 0.25 0.5
Miles
N

MARTHA'S VINEYARD COMMISSION

MASSGIS Massachusetts Geographic Information System

Affected Critical Facilities

MVC ID	Site Name	Site Category	Buffer or Pitch Pine
23	West Tisbury Fire Department - State Rd	Fire Department	Buffer
23	West Tisbury Fire Department - State Rd	Primary Emergency Operations Center	Buffer
23	West Tisbury Police Department - State Rd	Police Station	Buffer
24	West Tisbury Fire Department - Edgartown Rd	Alternate Emergency Operations Center	Buffer
24	West Tisbury Fire Department - Edgartown Rd	Fire Department	Buffer
34	Martha's Vineyard Public Charter School	School	Buffer
40	West Tisbury Elementary	MassCare Center	Buffer
40	West Tisbury Elementary	School	Buffer
51	Martha's Vineyard Agricultural Hall	MassCare Center	Buffer
52	Island Children's School	DayCare Center	Buffer
68	Laura L. Entner's Day Care	DayCare Center	Buffer
85	Dr. Michele Jasny	Vet/Animal Shelter	Buffer



Wildland Urban Interface
West Tisbury, MA

Pre-Disaster Mitigation Plan

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

Vegetation
- Pitch Pine or Shrub Oak
- Affected Structures
- Bridges
- Transmission Lines
- Critical Road Segment

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

Roads
- Primary Road
- Secondary Road
- Tertiary Road

Town Boundary

NOTES:
This map was produced by the Martha's Vineyard Commission for the Pre-Disaster Mitigation Project of May 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.

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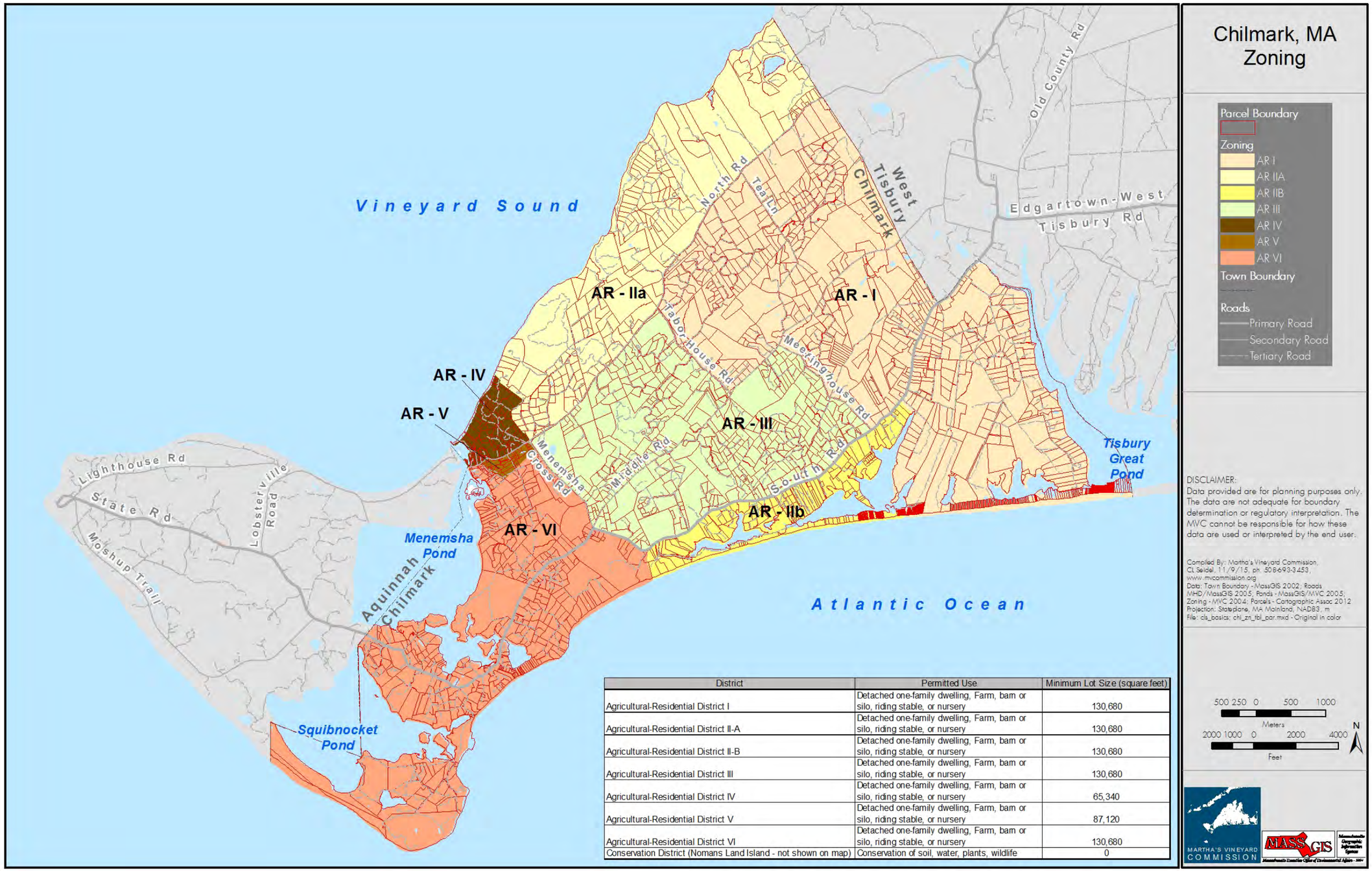
Data: Town Boundary - MassGIS 2002; Roads - MHD/MassGIS 2005; Critical Facilities & Infrastructure - MEMA 2006 & MVC 2014; Woodlands - MassGIS 2005 & MVC 2013; Vegetation - TNC 2005; Structures - MassGIS 2011 (released 2013) & MVC 2013; Fire Lane - MVC 2005
Projection: Stateplane, MA-Mainland, NAD83, Meters
File: cls_pdm; Wtl_WildFire_2013.mxd - Original in color

500 250 0 500 1000 Meters

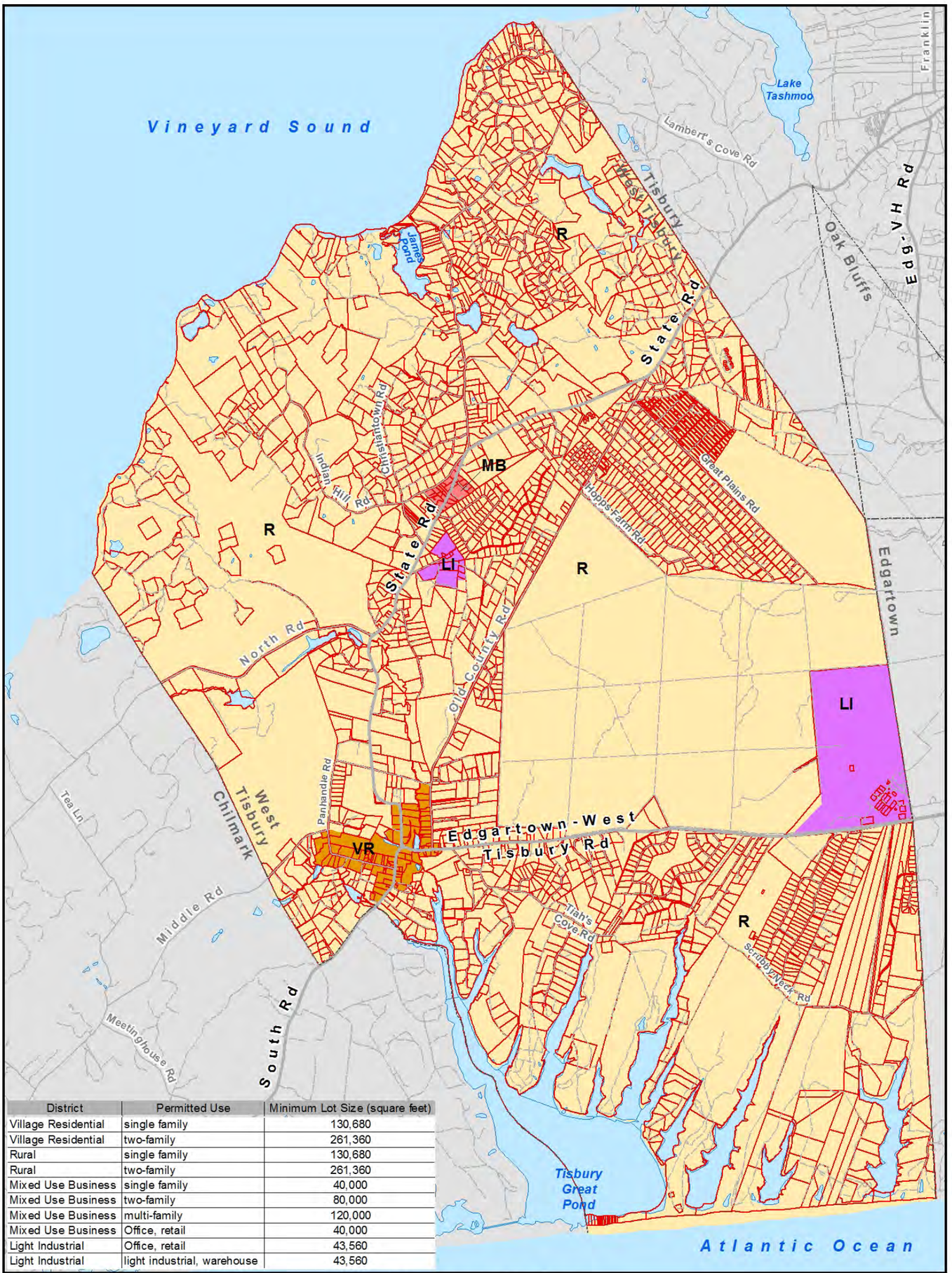
0.5 0 0.5 1 Miles

N

MARTHA'S VINEYARD COMMISSION



District	Permitted Use	Minimum Lot Size (square feet)
Agricultural-Residential District I	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	130,680
Agricultural-Residential District II-A	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	130,680
Agricultural-Residential District II-B	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	130,680
Agricultural-Residential District III	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	130,680
Agricultural-Residential District IV	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	65,340
Agricultural-Residential District V	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	87,120
Agricultural-Residential District VI	Detached one-family dwelling, Farm, barn or silo, riding stable, or nursery	130,680
Conservation District (Nomans Land Island - not shown on map)	Conservation of soil, water, plants, wildlife	0



District	Permitted Use	Minimum Lot Size (square feet)
Village Residential	single family	130,680
Village Residential	two-family	261,360
Rural	single family	130,680
Rural	two-family	261,360
Mixed Use Business	single family	40,000
Mixed Use Business	two-family	80,000
Mixed Use Business	multi-family	120,000
Mixed Use Business	Office, retail	40,000
Light Industrial	Office, retail	43,560
Light Industrial	light industrial, warehouse	43,560

West Tisbury, MA - Zoning

Zoning
- VR - Village Residential
- R - Rural
- MB - Mixed Use Business
- LI - Light Industrial

Parcel Boundary

Roads
- Primary Road
- Secondary Road
- Tertiary Road

0.5 0.25 0 0.5 1 Kilometers

0.5 0.25 0 0.5 1 Miles

N

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, 11/9/15, ph. 508-693-3453, www.mvcommission.org
Data: Town Boundary - MassGIS 2002; Roads MHD/MassGIS 2005; Ponds - MassGIS/MVC 2005; Zoning - MVC 2013; Parcels - Cartographic Assoc - 2014
Projection: Stateplane, MA Mainland, NAD83, m
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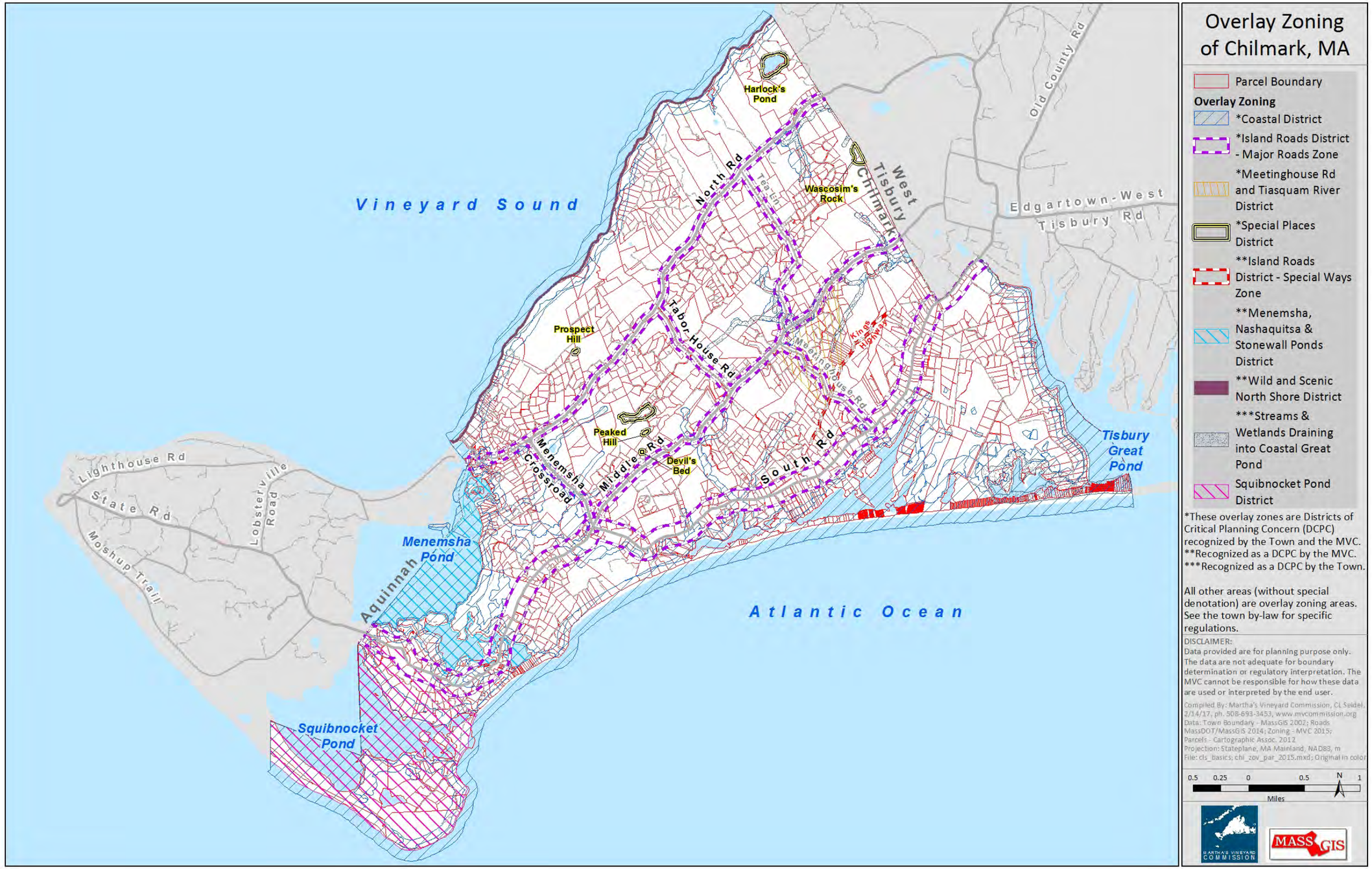
Overlay Zoning of Chilmark, MA
Parcel Boundary
Overlay Zoning
*Coastal District
*Island Roads District - Major Roads Zone
*Meetinghouse Rd and Tiasquam River District
*Special Places District
**Island Roads District - Special Ways Zone
**Menemsha, Nashaquitsa & Stonewall Ponds District
**Wild and Scenic North Shore District
***Streams & Wetlands Draining into Coastal Great Pond
Squibnocket Pond District
*These overlay zones are Districts of Critical Planning Concern (DCPC) recognized by the Town and the MVC.
**Recognized as a DCPC by the MVC.
***Recognized as a DCPC by the Town.
All other areas (without special denotation) are overlay zoning areas. See the town by-law for specific regulations.
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Compiled By: Martha's Vineyard Commission, CL Seidel, 2/14/17, ph. 508-693-3453, www.mvcommission.org
Data: Town Boundary - MassGIS 2002; Roads MassDOT/MassGIS 2014; Zoning - MVC 2015; Parcels - Cartographic Assoc. 2012
Projection: Stateplane, MA Mainland, NAD83, m
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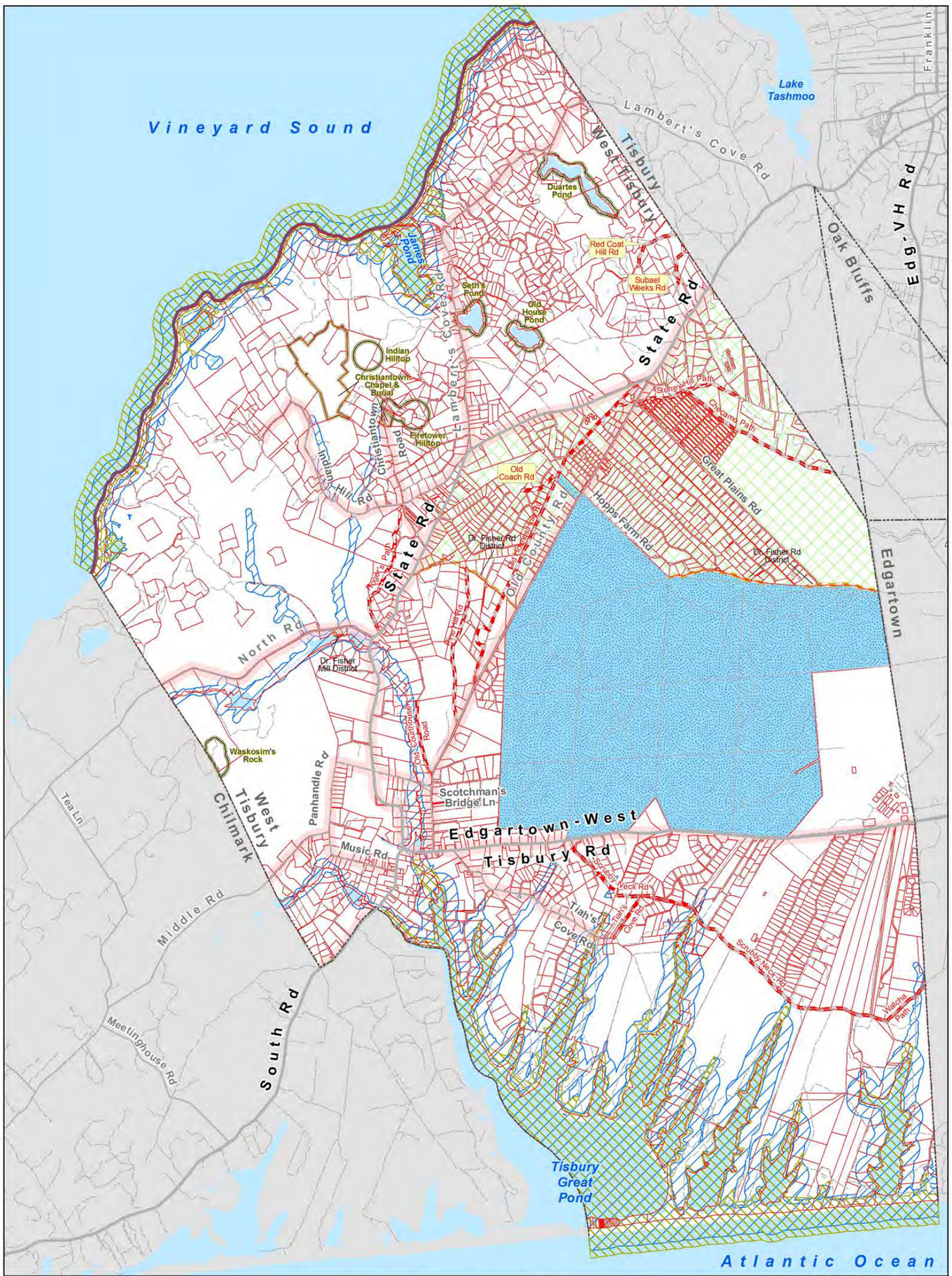
0.5 0.25 0 0.5 1
Miles
N
MARTHA'S VINEYARD COMMISSION
MASS GIS
Vineyard Sound
Atlantic Ocean
Harlock's Pond
Wascosim's Rock
Prospect Hill
Peaked Hill
Devil's Bed
Menemsha Pond
Squibnocket Pond
Tisbury Great Pond
North Rd
Tabor House Rd
Middle Rd
South Rd
Menemsha Crossroad
Meetinghouse Rd
Kings Highway
West Tisbury Rd
Chilmark Rd
Old County Rd
Edgartown-West Tisbury Rd
Lighthouse Rd
State Rd
Lobsterville Road
Moshup Trail
Aquinnah



Overlay Zoning of West Tisbury, MA

Parcel Boundary

West Tisbury Overlay Zoning

- Coastal District*
- Dr. Fisher Mill District*
- Dr. Fisher Road District*
- Flood Plain Zone
- Greenlands Water Resource Protection District
- Island Road District - Major Roads Zone*
- Island Road District - Special Ways Zone*
- M.V. State Forest Aquifer Resource District*
- Special Places District*
- Wild and Scenic North Shore District*

*These overlay zones are Districts of Critical Planning Concern (DCPC). The remaining areas are simply overlay zoning areas. See the latest zoning by-law for additional details.

N 0.5 0.25 0 0.5 1 Miles

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Data: Town Boundary - MassGIS 2002; Roads MHD/MassGIS 2005; Ponds - MassGIS/MVC 2005; Zoning - MVC 2015; Parcels - Cartographic Assoc 2014
Projection: Stateplane, MA Mainland, NAD83, m
File: cls_basics; wti_zov_par.mxd - Original in color

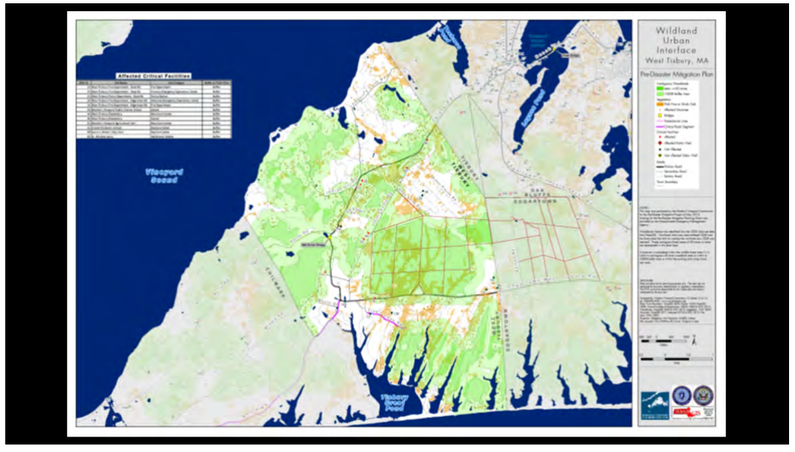
West Tisbury & Chilmark Municipal Vulnerability Preparedness (MVP)

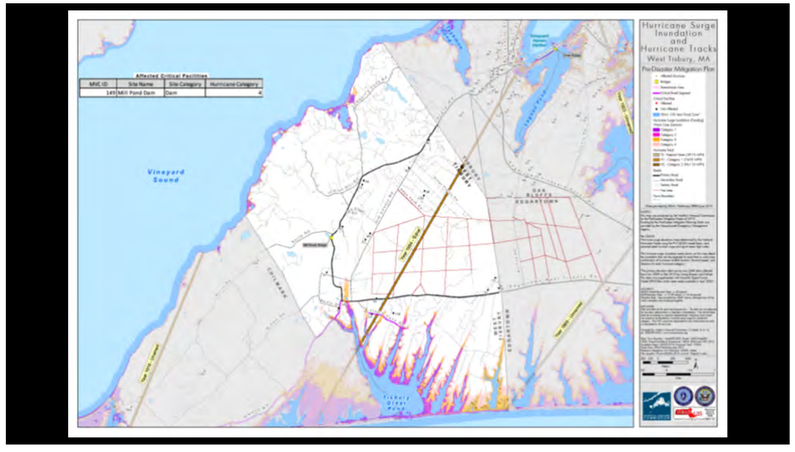
MVP Overview

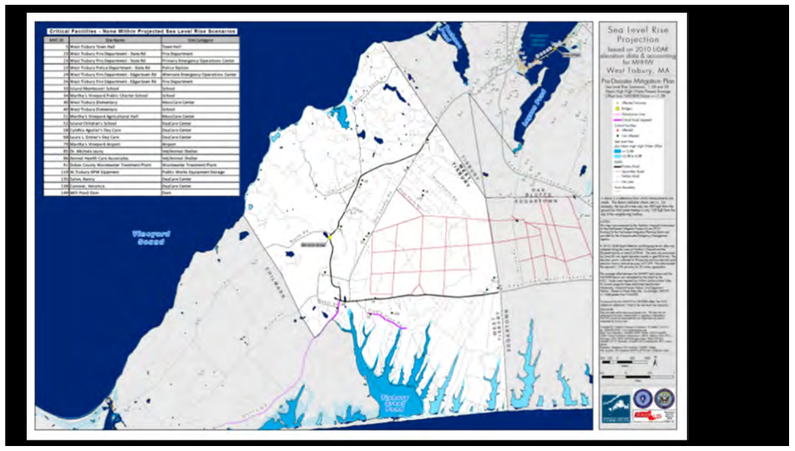
- Increasing threats from hazards, climate change
- Executive Office of Energy and Environmental Affairs (EEA)
- Municipal Vulnerability Preparedness (MVP) designation
- MVP designation process: Identify
  - Hazards
  - Vulnerabilities
  - Action Items
- Final report
- MVP designation: eligibility for funding for action items

Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

- Identified key hazards:
  - Inland and Coastal Flooding
    - Hurricanes
    - Nor-easters
  - Sea level rise
  - Wildfires
  - Drought





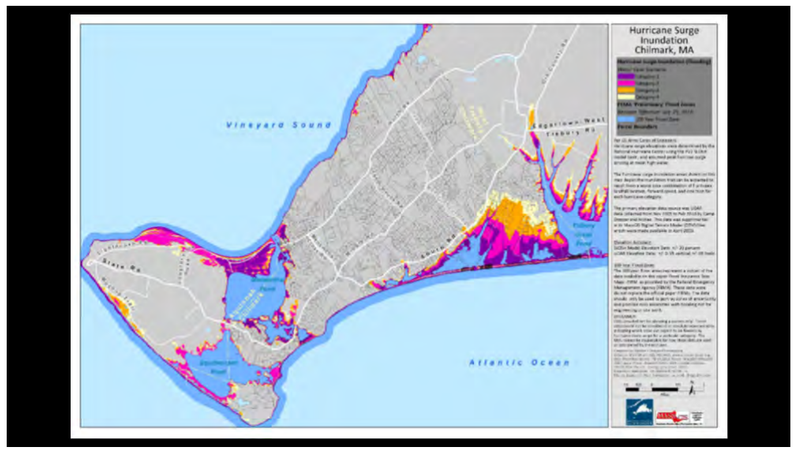


Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

- Identified vulnerable residents, West Tisbury:
  - Wildfire
    - About 3000 people within risk area (during summer)
  - Storm Surge
    - 110 people within SLOSH category 4 (during summer)
  - Flooding
    - 38 people within 100 yr flood (during summer)
  - Sea Level Rise
    - 4 people within 5' SLR

Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

- Identified vulnerable facilities, West Tisbury:
  - Wildfire
    - Daycare Center (1)
    - Fire Stations (2)
    - Schools (3)
    - Mill Brook Bridge
    - Transmission lines
  - Flooding and Storm Surge
    - Parts of State Rd
    - Parts of Tiah's Cove Rd

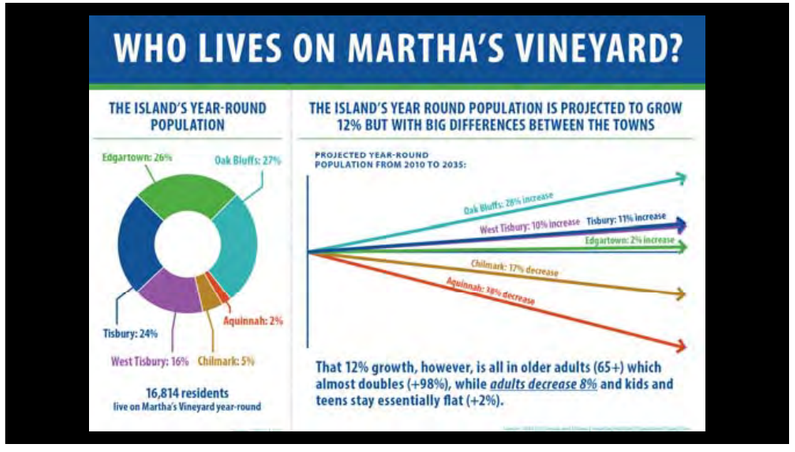


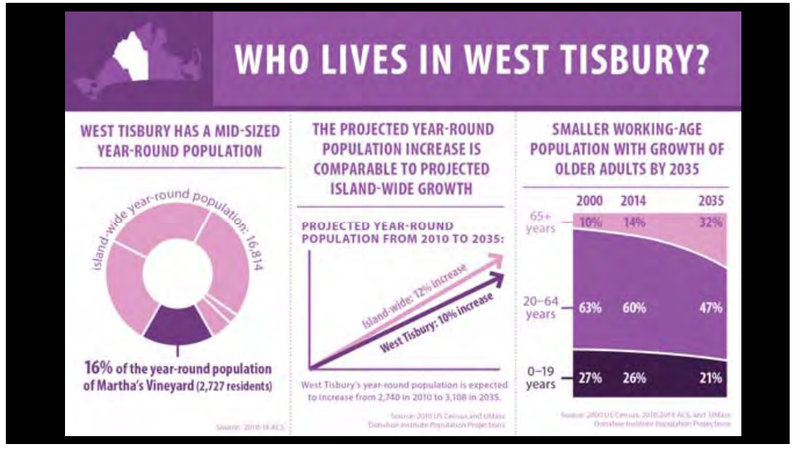
Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

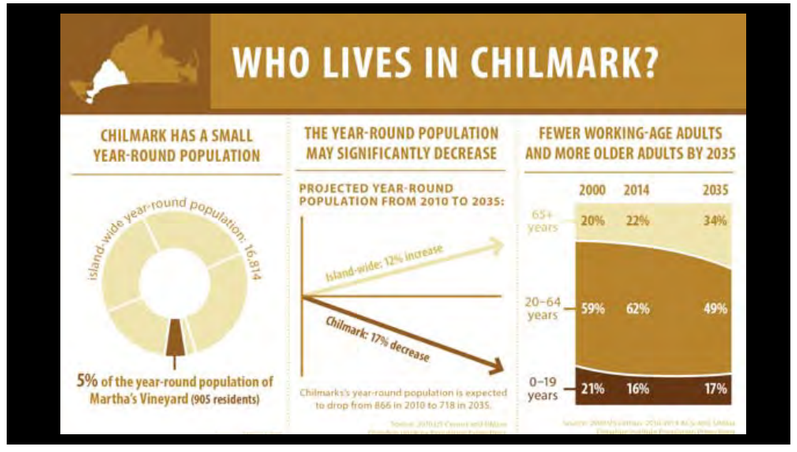
- Identified vulnerable residents, Chilmark:
  - Wildfire
    - About 2000 people within risk area (during summer)
  - Storm Surge
    - About 280 people within SLOSH category 4 (during summer)
  - Flooding
    - 220 people within 100 yr flood (during summer)
  - Sea Level Rise
    - 34 people within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

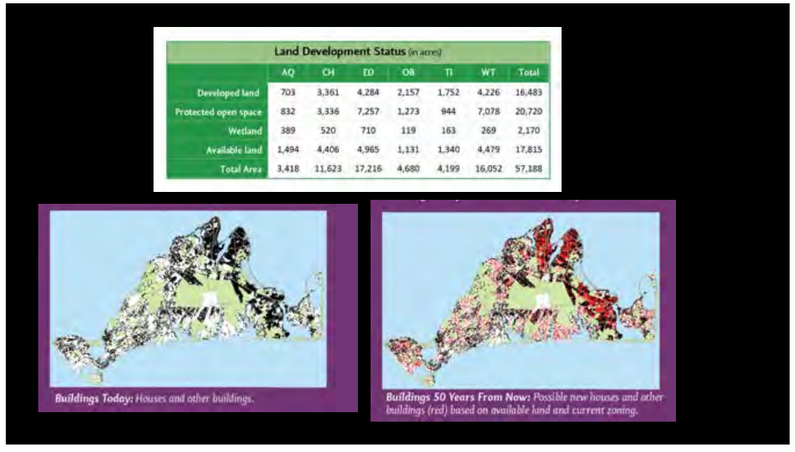
Martha's Vineyard Commission's 2015 Hazard Mitigation Plan

- 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

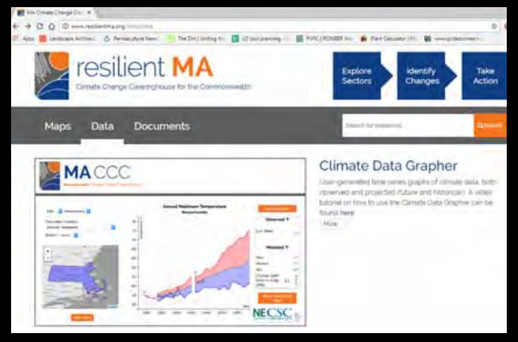








Statewide Climate Change Data



Expected in MA by mid-21stCentury

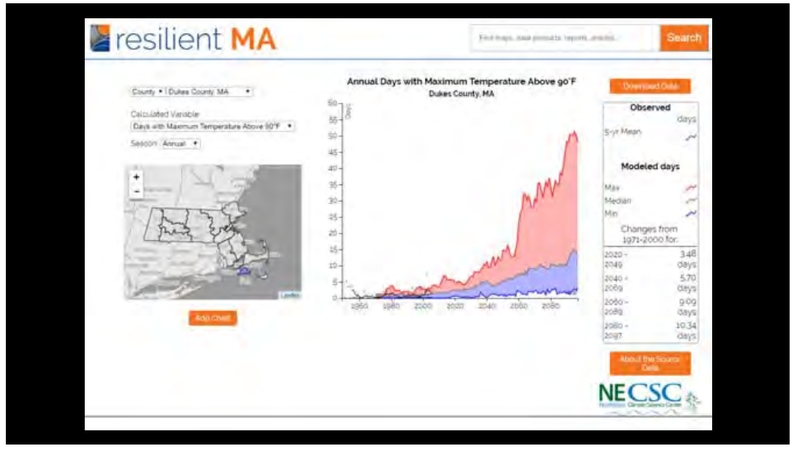
**Relative to the 1971-2000 average*

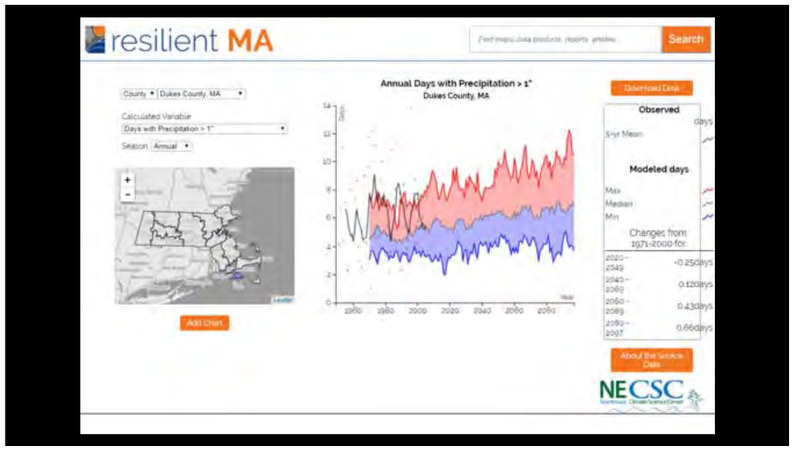
- Mean annual temp 2.8-6.2°F warmer
- 7-26 more days per year over 90°F
- 19-40 fewer days below 32°F (a decline of 13-27%)
- Total heating degree-days 11-24% lower
- Cooling degree-days 57-150% higher
- Growing degree-days 23-52% higher, and longer growing season

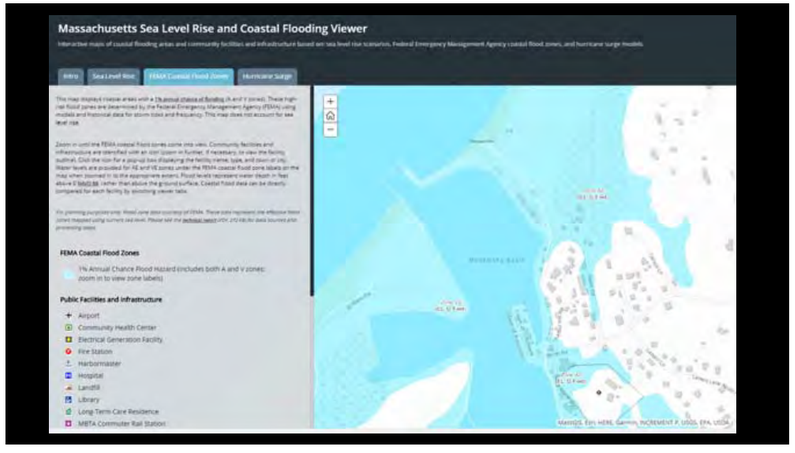
Expected in Dukes County by mid-21stCentury

**Relative to the 1971-2000 average*

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





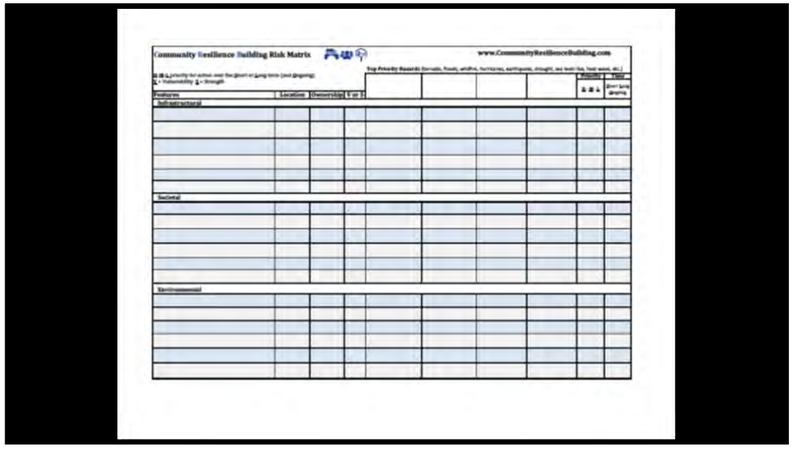


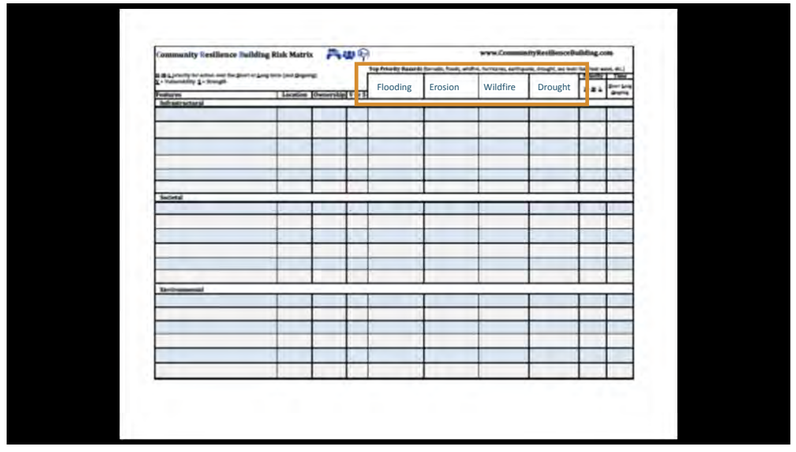
Impacts of Climate Change?

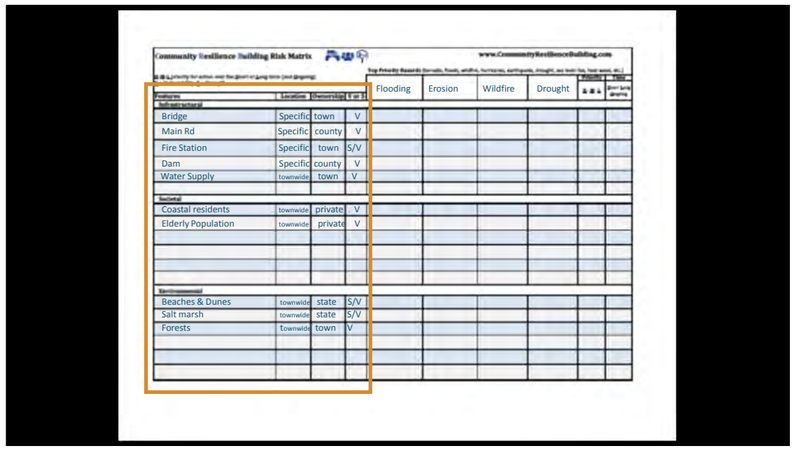
- Intense rain events: increased flooding?
- Erosion?
- More dry periods, risk of wildfire?
- Disrupted ecosystems and habitats, fisheries?
- Others?

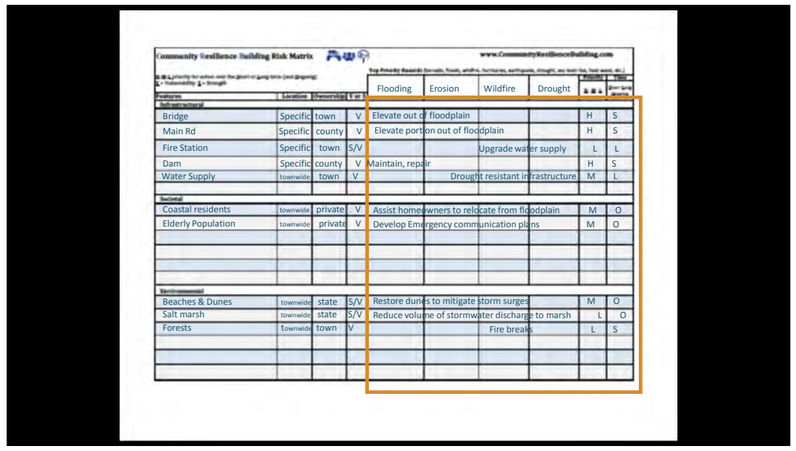
MVP Process

- Community Resilience Building Workshop (today and Sunday)
  - Characterize hazards
  - Identify community vulnerabilities and strengths
  - Identify and prioritize community actions
  - Determine the overall priority actions
  - Put it all together
  - Moving forward


Community Resilience Building Risk Matrix
www.CommunityResilienceBuilding.com
Top Priority Hazards (tornado, flood, wildfire, hurricane, earthquake, drought, sea level rise, heat wave, etc.)
Priorities
Time
Features
Location
Ownership
V or S
Infrastructural
Societal
Environmental


Community Resilience Building Risk Matrix
www.CommunityResilienceBuilding.com
Flooding
Erosion
Wildfire
Drought
Infrastructural
Societal
Environmental


Community Resilience Building Risk Matrix
www.CommunityResilienceBuilding.com
Flooding
Erosion
Wildfire
Drought
Infrastructural
Bridge Specific town V
Main Rd Specific county V
Fire Station Specific town S/V
Dam Specific county V
Water Supply townwide town V
Societal
Coastal residents townwide private V
Elderly Population townwide private V
Environmental
Beaches & Dunes townwide state S/V
Salt marsh townwide state S/V
Forests townwide town V


Community Resilience Building Risk Matrix
www.CommunityResilienceBuilding.com
Flooding
Erosion
Wildfire
Drought
Infrastructural
Bridge Specific town V Elevate out of floodplain H S
Main Rd Specific county V Elevate portion out of floodplain H S
Fire Station Specific town S/V Upgrade water supply L L
Dam Specific county V Maintain, repair H S
Water Supply townwide town V Drought resistant infrastructure M L
Societal
Coastal residents townwide private V Assist homeowners to relocate from floodplain M O
Elderly Population townwide private V Develop Emergency communication plans M O
Environmental
Beaches & Dunes townwide state S/V Restore dunes to mitigate storm surges M O
Salt marsh townwide state S/V Reduce volume of stormwater discharge to marsh L O
Forests townwide town V Fire breaks L S

APPENDIX E: WORKSHOP GROUPS' TOP ACTIONS WITH LARGE GROUP "DOT VOTES"

The four workshop groups were asked to share their top three to five action items. Similar items were clustered into groups. All participants were given three green dot stickers and invited to place stickers next to action items they felt were most important. Participants could choose whether to put all 3 dots alongside one item, or spread their votes out among two or three items. Some of these items represent programs or features which are already in place and need enhancement, while others would require initiating a new project.

The Core Team used this information alongside the completed CRB Matrices, recommendations from the 2015 Hazard Mitigation Plan, and an assessment of short-range vs long-range prioritization to arrive at the top recommendations in this report.