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Summary of Findings Tisbury Municipal Vulnerability Preparedness Workshop

Tisbury, Massachusetts

October 17, 2018



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Tisbury Municipal Vulnerability Preparedness (MVP) Workshop *Summary of Findings*

Acknowledgements:

Funding to support the Tisbury Municipal Vulnerability Preparedness (MVP) workshop was provided by the Massachusetts Executive Office of Energy and Environmental Affairs through an MVP Planning Grant, issued to the Town of Tisbury during the fiscal year of July 2018 through June 2019. The Town of Tisbury contracted with the Horsley Witten Group, Inc. to provide MVP-certified staff to support the Town in planning and facilitating the workshop.

The core planning team would like to thank St. Augustine's Church for providing a workshop facility, the Town of Tisbury for providing refreshments and the Martha's Vineyard Commission for providing GIS layers to develop the base maps.

Suggested Citation:

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Executive Summary

On October 17, 2018, the Town of Tisbury held a Municipal Vulnerabilities Preparedness (MVP) workshop. The goals of the workshop were to identify hazards Tisbury faces that are being exacerbated by climate change, and to prioritize actions the Town can take to prepare for identified hazards. This workshop, planned by a core team of organizers and the Horsley Witten Group, Inc., (HW) was a step towards MVP certification, which allows certified communities access to additional state grants for projects related to climate change resiliency. Thirty-six community members attended the workshop, representing a wide cross section of Town officials, response partners, and other interested parties.

During discussion, participants concluded that the most relevant climate change hazards to Tisbury were hurricanes and Nor'easters, coastal flooding and storm surge, sea level rise, and intense rain and flooding. Working in four small groups, participants listed features of Tisbury that may be impacted by climate change (vulnerabilities) or may help the community cope with climate-related hazards (strengths). The groups then recommended actions that could be taken to protect Tisbury's infrastructure, people and environment from the impacts of climate-related hazards. Following small and large group discussions, the workshop participants selected the following seven high priority action items, in no particular order:

- 1. Conduct a comprehensive supply chain vulnerability assessment.
- 2. Identify and initiate harbor improvements (e.g., breakwater extensions) to protect downtown areas and the harbor.
- 3. Identify and undertake roadway improvements that improve resiliency to coastal flooding, storm surge and sea level rise in locations including, but not limited to:
 - Water Street from 5 Corners to Union Street.
 - Beach Road from 5 Corners to the Bridge.
 - Lagoon Pond Road from 5 Corners to Hines Point.
- 4. Develop a comprehensive stormwater management plan for the community.
- 5. Review and update the Tisbury section of the Dukes County Hazard Mitigation Plan.
- 6. Increase community education and outreach with regards to climate change hazards, emergency preparedness and sheltering options.
- 7. Review Town regulations and identify changes that could mitigate future impacts of climate change.

These high priority action items will be incorporated into ongoing municipal planning efforts. High priority action items identified in this process are also eligible for future grant funding under the MVP Action Grants program administered by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA). By undertaking the MVP workshop and preparing this report, the Town of Tisbury is also initiating its certification as an MVP Certified Community, which elevates the scoring profile for related project proposals to other state grant programs.

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Attachments

Attachment A: Tisbury MVP Workshop Participants List Attachment B: Workshop Handouts Attachment C: Tisbury Base Maps Attachment D: All Groups – Completed Risk Matrices Attachment E: All Groups – Annotated Tisbury Base Maps Attachment F: All Groups – Recommended Action Items Attachment G: High Priority Action Items

1. Introduction

The Municipal Vulnerability Preparedness (MVP) program is a Massachusetts state program designed to increase municipality-level resilience to natural hazards being exacerbated by climate change. This program helps municipalities identify their vulnerabilities, strengths, and opportunities to take action to reduce risk and build resilience. MVP workshops use the Community Resilience Building (CRB) Framework, a system of discussion and notetaking developed by The Nature Conservancy and prescribed by the MVP Program. The Town of Tisbury (the Town) received a grant to participate in the MVP



program in order to build on its prior resiliency planning efforts and develop a list of priority actions for the immediate future.

Workshop Planning and Core Team

Following the award of the technical assistance grant, several Town officials and local committee members formed a core planning team. Team members included the following individuals, who were assisted by Will Keefer of the Horsley Witten Group, Inc. (HW), Tisbury's MVP Provider:

- Pam Bennett, Administrative Assistant to the Town Administrator and Board of Selectmen
- Christina Colarusso, Tisbury Wastewater Planning Committee/Department of Public Works (DPW) Advisory Board
- Cheryl Doble, Chair of Planning Board
- Jay Grande, Town Administrator
- Patricia Harris, Assistant to the Planning Board
- Gerard Hokanson, Tisbury Waterways, Inc.
- Alexandra Karl, Executive Assistant to the Town Administrator and Board of Selectmen
- Roger Moffat, Tisbury Waterways and Harbor Planning Committee
- Doug Reece, Tisbury Wastewater Planning Committee/Lagoon Pond Association
- John Schilling, Fire Chief

Team members met three times in September and October 2018, and communicated via email and telephone as needed. Responsibilities of the core team included:

- Confirming workshop logistics (e.g., date, location).
- Reviewing the workshop agenda.
- Providing reference material, context and background for the MVP effort.
- Reviewing maps and reference materials for use in workshop discussion groups.
- Identifying a group of representative stakeholders to invite to the workshop.
- Reaching out to invitees to encourage attendance.

The core team also participated in the workshop as discussion facilitators, note takers and stakeholders.

Workshop Attendees and Materials

Tisbury's MVP workshop was held on October 17, 2018 at St. Augustine's Church, 56 Franklin Street, Vineyard Haven. A total of 58 stakeholders were invited to the workshop and 36 stakeholders attended. Participants represented a cross section of the Town's stakeholders and decision-makers, including representatives from the Red Cross, the local hospital, the Steamship Authority, non-profits, the Martha's Vineyard Museum, and a wide variety of municipal department staff and volunteers from local boards and commissions. **Attachment A** includes a full list of participants, including their organizational affiliation. On the day of the workshop, participants were provided with the following materials:

- Workshop agenda
- Overview Presentation PowerPoint slides with note taking space
- Summary of climate projections for the Martha's Vineyard Basin provided by EEA and prepared by the Northeast Climate Science Center
- Summary of Tisbury demographic data
- Handout summarizing Tisbury actions previously identified and recommended in the 2015 Dukes County Hazard Mitigation Plan
- Example vulnerabilities and strengths excerpted from the CRB guidance document

Attachment B provides a copy of the participant materials. Participants were also provided with Tisbury base maps showing critical infrastructure along with FEMA floodplain data, hurricane surge inundation data, and sea level rise inundation data (**Attachment C**).

Workshop Overview

The Town Administrator, Jay Grande, provided opening remarks, welcomed everyone to the workshop and reiterated the important role that the invited stakeholders had in determining a way forward in the community with regards to preparing for future climate change. Following introductions and an overview of the MVP program and workshop agenda, participants listened to a presentation by MVP-

certified facilitator Will Keefer, of HW, about climate change projections and their current and potential future impacts on Tisbury. Mr. Keefer shared the following central objectives of the workshop:

- 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.



Additionally, the presentation highlighted specific challenges currently facing the Town in the light of climate change. Challenges discussed included weather events (e.g., Nor'easters, severe weather) that disrupt the flow of people and services to and from Martha's Vineyard. Participants stressed that Tisbury has the only year-round ferry stop (Vineyard Haven) and that even one or two days of missed

ferry service can negatively impact not just Tisbury, but the entire island. Following this introduction, HW led a large group conversation to confirm the four primary climate change hazards chosen by stakeholders through an online poll prior to the event. These were used to frame the rest of the workshop.

The next phase of the workshop was conducted in four small discussion groups. Groups were made up of an HW staff member as facilitator, a note taker from the community and nine community stakeholders. The small groups began their discussions by listing environmental, societal and infrastructural features that represent either a vulnerability or a strength of the community with regards to anticipated climate change hazards. The note taker in each group listed these items within the CRB Risk Matrix, a system for note taking developed as a part of the CRB Framework. Groups listed multiple features for each category, along with information about their location, ownership, and if the feature is a strength or vulnerability for the Town. **Attachment D** includes scanned copies of each groups risk matrices. When appropriate, the groups also marked these features on the base maps provided at each table (**Attachment E**).

Following a midday break, the small groups discussed action items for each feature. Action items could either be a way to protect a vulnerable feature from a negative impact, or a way to better utilize one of Tisbury's strengths. Common action items suggested by participants included: raising or protecting critical infrastructure, mitigating stormwater challenges and addressing supply chain vulnerabilities.

Each group then came to an agreement on five or six action items that they felt would most effectively address infrastructural, societal and



environmental vulnerabilities in the Town or build on existing strengths (**Attachment F**). Then, a representative from each group reported out their recommended action items, along with a brief summary of their group's discussion. Following the presentation of each group's recommended action items, workshop participants, together along with the workshop facilitator, combined duplicative suggestions to create a final list of seven high priority action items that the Town of Tisbury should embark upon to increase the resilience of the community in the face of anticipated climate change hazards, in no particular order:

- 1. Conduct a comprehensive supply chain vulnerability assessment.
- 2. Identify and initiate harbor improvements (e.g., breakwater extensions) to protect downtown areas and the harbor.
- 3. Identify and undertake roadway improvements that improve resiliency to coastal flooding, storm surge and sea level rise in locations including, but not limited to:
 - Water Street from 5 Corners to Union Street.
 - Beach Road from 5 Corners to the Bridge.
 - Lagoon Pond Road from 5 Corners to Hines Point.
- 4. Develop a comprehensive stormwater management plan for the community.
- 5. Review and update the Tisbury section of the Dukes County Hazard Mitigation Plan.

- 6. Increase community education and outreach with regards to climate change hazards, emergency preparedness and sheltering options.
- 7. Review Town regulations and identify changes that could mitigate future impacts of climate change.

Attachment G provides a table of the seven recommended action items.

The results of each stage of the workshop are presented in the subsequent sections of this report and its attachments.

2. Top Climate Change Hazards of Concern

Prior to the October 17, 2018 workshop, the core planning team decided to provide an opportunity for stakeholders to choose the top four climate change hazards of concern through an online poll. This was done to build consensus prior to the workshop and to allow more time for small group discussion during the event. The following list presents the potential climate change hazards proposed to the stakeholder in the online poll:

- Intense rain/flooding
- Wind events
- Hurricanes or Nor' Easters
- Winter storms
- Extreme cold
- Extreme heat/heat waves
- Fire
- Drought
- Coastal flooding/storm surge
- Sea level rise

Approximately half of the invited stakeholders answered the poll and based on the survey results (**Figure 1**), the participants chose the following climate change-related hazards as the most significant to Tisbury:

- Hurricanes or Nor' Easters
- Coastal flooding/storm surge
- Sea level rise
- Intense rain/flooding



HW led a large group discussion to confirm the four climate change hazards prior to the start of the small group discussion. The participants were in agreement that the workshop should focus on these hazards, but felt that it would be important to discuss additional hazards (e.g., fire) in the small groups if they came up as well.

Total Respondents: 26

3. Current Concerns and Challenges Presented by Climate Change Hazards

Tisbury has experienced a number of climate- and weather-related challenges in recent years, and can expect to experience more severe events in the years to come due to climate change. For example, intense rain storms in 2017 and 2018 have caused street flooding that limits the ability for people to get around, especially in the waterfront area where a lot of community commercial property and gathering places (e.g., Post Office) are located. In fact, one week prior to the workshop the remnants of Hurricane Michael caused street flooding. In March 2018 there were four Nor'easters that led to coastal flooding, power outages and major travel disruptions. During the first Nor'easter from March 1 - 3, the Steamship Authority, which provides passenger and cargo ferry service from Woods Hole to Vineyard Haven, was shut down for two days. Even shutdowns of two days can cause major disruptions to not only life in Tisbury, but on the rest of the island as Tisbury is home to the only year round terminal on Martha's Vineyard. In addition, many roadways in the community have been flooded due to storm surge and surcharged stormwater drainage systems, or in some cases, both.

The biggest challenges, concerns and vulnerabilities for Tisbury that were raised in the small group discussions at the MVP workshop are noted in the CRB matrices in **Attachment D** and summarized below.

- Coastal flooding due to storm surge: During intense rain events and/or storm surge events flooding regularly occurs on the properties along the waterfront in the Steamship Authority-Five Corners-Beach Road area, and along Lagoon Pond Road. In addition, during high tides and/or storm surge events, stormwater drainage in this area can back up and cause flooding in the commercial district. Many key pieces of infrastructure are within this area and are at risk of failure due to flooding.
- Inland flooding due to heavy rain: The stormwater network can also back up during heavy rain events. Participants offered both structural and land use planning strategies that may be used to address these issues. Stakeholders identified the need for a comprehensive stormwater study to identify ways to increase retention time in higher areas, which would result in reduced flow to flood prone areas. Projects suggested included increasing green space, utilizing porous pavement, adding green infrastructure, as well as the redirection and diversion of water to bioretention systems in key areas to avoid flooding and pollution of harbor. Contaminated coastal waters can hinder the economic wellbeing of the Town, which depends on tourism from fishing, boating, swimming and recreating near the shore, as well as a developing shellfish industry.
- *Coastal erosion:* The coastline in the harbor area has experienced erosion over the past several decades, putting infrastructure and the commercial district at risk. Beach Road, which provides an important transportation route to and from the community, is particularly vulnerable to undercutting and overtopping and needs to be hardened. In addition, the Eastville breakwater is insufficient in length to adequately protect the harbor and Beach Road. Both hard (e.g., breakwaters, seawalls) and soft (e.g., beach nourishment) structural solutions have been suggested to address these issues.

- High wind events: Winter snow storms and wind events experienced in the early months of 2018 caused widespread power outages throughout the community, and drew significant attention to the risks to the power grid from future severe weather events. Most of Tisbury's electrical wires are above ground.
- Supply chain vulnerabilities: The natural hazards described above can severely impact the Town's supply chain and cause cascading impacts on the population. Most goods are brought to the island via ferry service and a significant portion of the skilled



workforce - up to 2,000 people per day - rely on the ferry to come to island. Therefore it is important for the Town to strengthen its resiliency and self sufficiency in order to be able to withstand long term disruptions in goods and service delivery. The suggestions included strengthening the Town's emergency preparedness, response, and recovery capabilities, which could be address through a combination of planning, community outreach, hazard mitigation planning and assessment of resources. In addition, the community would like to develop further fuel storage capacity.

4. Current Strengths and Assets

A number of strengths were also identified among the infrastructural, societal and environmental assets of the Town. These strengths were noted on the CRB Risk Matrices (**Attachment D**) and include:

Infrastructural:

- Tisbury's Vineyard Haven terminal is the only year-round port for the delivery of resources, including propane, fuel oil and gasoline to Martha's Vineyard.
- The R.M. Packer Marine Terminal also receives regular petroleum deliveries for its customers.
- Eversource has been very responsive in past storms in restoring electrical service to the Town.
- Martha's Vineyard Transit Authority provides regular bus service throughout the community.
- The Martha's Vineyard Airport provides regular passenger services to the island.
- Generators are in place at the Steamship Authority and at other municipal buildings.
- The Town Hall, emergency services, evacuation centers, and the transfer station are all located at a higher elevation and are therefore at reduced risk of flooding.

Societal:

- The Town developed a "vulnerable population" list for emergency planning purposes.
- The solar array at the landfill provides alternative energy source to the community. It may be possible in the future to store the energy in batteries.
- The <u>Martha's Vineyard Volunteer Emergency Service Organizations</u> provide emergency response capabilities along with citizen volunteers.
- The Town is a tight knight community where neighbors help neighbors.

Environmental:

- Veteran's Park provides a natural capacity for flooding and water infiltration.
- West Chop barrier beaches and natural wetlands absorb coastal and stormwater flooding.
- The community is increasing island self sufficiency through food production, both agriculturally and hunting/fishing.
- Pristine sole source aquifer for drinking water.
- Barrier beaches provide natural protection from erosion and storm surge.

The identified strengths and assets are examples of features that should be protected and replicated throughout the community to protect against future impacts of climate change

5. Top Recommendations to Improve Resilience

Following the presentation of each group's five to six recommended action items to address vulnerabilities and build on existing strengths (**Attachment F**), workshop participants, along with the workshop facilitator and combined duplicative suggestions to create a final list of seven high priority action items. These seven high priority action items are included in **Attachment G** and are listed below, in no particular order:

1. Conduct a comprehensive supply chain vulnerability assessment.



- 2. Identify and initiate harbor improvements (e.g., breakwater extensions) to protect downtown areas and the harbor.
- 3. Identify and undertake roadway improvements that improve resiliency to coastal flooding, storm surge and sea level rise in locations including, but not limited to:
 - Water Street from 5 Corners to Union Street.
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- 4. Develop a comprehensive stormwater management plan for the community.
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- 6. Increase community education and outreach with regards to climate change hazards, emergency preparedness and sheltering options.
- 7. Review Town regulations and identify changes that could mitigate future impacts of climate change.

6. Conclusion and Next Steps

Tisbury held a formal public information and listening session at 7:00 PM on November 8, 2018 at the Tisbury Senior Center, 34 Pine Tree Road in Vineyard Haven. This session provided an opportunity for members of the public to learn, ask questions and provide feedback regarding the seven high priority action items that emerged from that October 17, 2018 MVP workshop. **Attachment H** provides a summary of discussion at the public listening session.

The Town also plans to coordinate with the other communities on Martha's Vineyard to identify common action items and to undertake island-wide planning.

High priority action items identified during the October 17, 2018 MVP workshop will be integrated into existing municipal planning efforts and the Town will also consider pursuing grant funding to implement the high priority action items identified through the MVP workshop process to continue to improve the Town's resilience to climate change.

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Attachment A: Tisbury MVP Workshop Participants

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Attachment A: Tisbury MVP Workshop Participants October 17, 2018

COUNT	FIRST NAME	LAST NAME	AFFILIATION	
1	Brittany	Baron	Martha's Vineyard Hospital	
2	Dawn	Bellante-Holand	Planning Board	
3	Pam	Bennett	Human Resource	
4	Malcolm	Boyd	Tisbury Board of Health	
5	Suzanne	Cioffi	Martha's Vineyard Transit Authority	
6	Christina	Colarusso	Tisbury Wastewater Planning Committee	
7	John	Crocker	Harbormaster	
8	Ann Marie	Cywinski	Red Cross	
9	Cheryl	Doble	Planning Board	
10	Greg	Endicott	Steamship Authority	
11	Danielle	Ewart	Shellfish	
12	John	Grande	Town Adminstration	
13	Phil	Hale	Martha's Vineyard Shipyard	
14	Patricia	Harris	Planning Board	
15	Gerry	Hokanson	Tisbury Waterways	
16	Tracey	Jones	Ambulatory Services	
17	James	Lengyel	Martha's Vineyard Landbank Commission	
18	Kirk	Metell	Facilities Manager	
19	Elaine	Miller	Planning Board	
20	Roger	Moffat	Tisbury Waterways and Harbor Management Committee	
21	Greg	Monka	Island Elderly Housing	
22	Adam	Moore	Sheriff's Meadow Foundation	
23	Janet	Packer	Tisbury School Committee	
24	Doug	Reece	Lagoon Pond Association	
25	Ben	Robinson	Planning Board	
26	Michael	Sawyer	Real Estate Development	
27	John	Schilling	Fire Department	
28	Christopher	Scott	Prime Marina Group	
29	Joyce	Stiles-Tucker	Council On Aging	
30	Bill	Straw	Energy Committee	

COUNT	FIRST NAME	LAST NAME	AFFILIATION		
31	Ray	Tattersall	Department of Public Works		
32	Bernadette	Thomas	Martha's Vineyard Hospital		
33	Maura	Valley	Board of Health		
34	Jane	Varkonda	Conservation Agent		
35	David	Vigneault	Dukes County Housing Authority		
36	Phil	Wallis	Martha's Vineyard Museum		

Attachment B: Workshop Handouts

- Workshop Agenda
- Tisbury MVP Workshop Overview Presentation Handout
- Climate Change Projections
- Selected Demographic Data
- Example Vulnerabilities and Strengths
- Key Recommendations from the 2015 Hazard Mitigation Plan

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Attachment B: Workshop Handouts



Horsley Witten Group



Tisbury Municipal Vulnerability Preparedness (MVP) Workshop Agenda

Wednesday, October 17, 2018

St. Augustine's Church \cdot 56 Franklin Street \cdot Vineyard Haven

TIME	ACTIVITIES					
8:30 AM	Arrival and Refreshments					
9:00 AM	Welcoming Remarks					
	Jay Grande, Town Administrator					
9:10 AM	Introductions and Overview of the Workshop					
	Will Keefer, Horsley Witten Group					
9:20 AM	Overview Presentation on Science, Past Planning Efforts and Outcomes, and Data					
	Resources					
	Review recent climate related events.					
	Present summary of anticipated climate changes.					
	Present summary of recent/existing planning efforts					
9:45 AM	Discussion #1: Large Group					
	Identify top 4 Climate Change Hazards facing Tisbury					
10:00 AM	15 Minute Break					
10:15 AM	Discussion #2: Small Group					
	Identify Features that are Vulnerabilities and Strengths					
11:30 AM	2 Hour Midday Break					
1:30 PM	Discussion #3: Small Group					
	Identify Actions to address Vulnerabilities or protect Strengths.					
	Discuss timeframe, responsibility, funding, as time allows.					
	Prioritize top 5-6 Actions					
3:00 PM	15 Minute Break					
3:15 PM	Discussion #4: Small Groups Report Out					
	Each group reports out top 5-6 Priority Actions					
3:45 PM	Final Discussion: Large Group					
	Select top 5-6 Priority Actions for Municipal Climate Resilience					
	Discuss timeframe, responsibility, funding					
4:15 PM	Wrap Up and Closing Remarks					
	lay Grande Town Administrator					
	Will Keefer Horsley Witten Group					
4:30 PM	Adjourn					

Attachment B: Workshop Handouts

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sbury Core	Planning Team	
Name	Representing	
Roger Moffat	Tisbury Waterways and Harbor Planning Committee	
Cheryl Doble	Chair of Planning Board	
Patricia Harris	Assistant to the Planning Board	
Doug Reece	Tisbury Wastewater Planning Committee/ Lagoon Pond Association	
Christina Colarusso	Tisbury Wastewater Planning Committee / DPW Advisory Board	
Jay Grande	Town Administrator	
John Schilling	Fire Chief	
Gerard Hokanson	Tisbury Waterways Inc.	
Alexandra Kral	Executive Assistant to the Town Administrator & Board of Selectmen	
Pam Bennett	Administrative Assistant to the Town Administrator & Board of Selectmen	n
Will Keefer	Horsley Witten Group (HW)	
October 13, 2019	Rorsley Witten Group	



Tisbu



Vulnerabil	ity, Resilience & Adaptation						
Vulnerability: the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes							
Resilience:	the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions						
Adaptation:	the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.						



October 2018











The Plan for Today – vibrant discussion

- Presentation to set the stage for our discussion
- Determine which climate change hazards to focus on
- Identify the most vulnerable features in Tisbury
- Identify the features that provide strength
- Develop actions what can the Town do to address vulnerabilities and protect/enhance strengths?
- · Prioritize the most important actions for Tisbury

Horsley Witten Group

SO, who's in the room today? Who....

- Has had a conversation in the past week about weird weather?
- Has had to respond to a weather-related emergency on the job? At home?
- Has ever been diverted on their way to work/home by flooded roads?
- Is employed by the Town of Tisbury?
- · Volunteers your time on a Town board or committee?
- Participated in the development of the Dukes County Hazard Mitigation Plan?

Horsley Witten Group









Climat	NE O	imilar to Maryland Cer	Similar to North Carolina
Table 1: T Martha's Parameter	Mid-Century (2050s)	End of Century (2090s)	
Average Av Maximum Maximum 2040-2069 2070-2099	53.0 - 55.8 61.0 - 63.9	53.6 - 59.7 61.6 - 67.7	
Annual Day	44.9 - 47.6 3 - 11	45.6 - 51.4	
Annual Her (Base 65°F	80 - 94 4,481 - 5,116	42 - 82 3,703 - 5,003	
(Base 50°F (Base 50°F	753 - 1,075 3,046 - 3,622	848 - 1628 3,201 - 4,574	
October 17, 201	ley Witten Group	3	

,			
Table 1: TEMPERATURE PROJECTIONS Martha's Vineyard Basin Climate Parameter	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Average Annual Temperature (°F)	50.6	53.0 - 55.8	53.6 - 59.7
Maximum Annual Temperature (°F)	58.8	61.0 - 63.9	616-67.7
Minimum Annual Temperature (°F)	42.3	44.9 - 47.6	45.6 - 51.4
Annual Days with Max Temp over 90°F	1	3 - 11	4 - 32
Annual Days with Min Temp below 32°F	105	80 - 94	42 - 82
Annual Heating Degree-Days (Base 65°F)	5772	4,481 - 5,116	3,703 - 5,003
Annual Cooling Degree-Days (Base 65°F)	486	753 - 1,075	848 - 1628
Annual Growing Degree-Days (Base 50°F)	2,553	3,046 - 3,622	3,201 - 4,574



Clima	Climate Projections					30-60% fe freezing	ewer days
Party of the	Table 1: TEMPERATURE PROJECTIONS						
	Martha's Vineyard Basin Climate Parameter	Baseline (1971-2000)		Mid-Century (2050s)	Er	d of Century (2090s)	A CONTRACTOR OF THE OWNER OF THE
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	Maximum Annual Temperature (°F)	58.8		61.0 - 63.9		61.6 - 67.7	and the second
	Minimum Annual Temperature (°F)	42.3		44.9 - 47.6		45.6 - 51.4	
the second	Annual Days with Max Temp over 90°F	1		3-11		4-32	the second second
	Annual Days with Min Temp below 32°F	105	t	80 - 94		42 - 82	
	Annual Heating Degree-Days (Base 65°F)	5772	4	4,481 - 5,116	3	,703 - 5,003	
	Annual Cooling Degree-Days (Base 65°F)	486		753 - 1,075		848 - 1628	There are and the
-	Annual Growing Degree-Days (Base 50°F)	2,553	3	3,046 - 3,622	3	,201 – 4,574	A CONTRACTOR
October 17	7, 2018	Horsley Witte	n Gro	yp 🛞			19

Climate	Climate Projections			Less energy required for indoor heating		More energy required for cooling]	
Table Marti Parar	1: TEMPERATURE PROJECTIONS ha's Vineyard Basin Climate meter	Baseline (1971-2000)		Mid-Century (2050s)	En	d of Century (2090s)		
Avera	ige Annual Temperature (°F)	50.6		53.0 - 55.8		53.6 - 59.7		
Maxir	mum Annual Temperature (°F)	58.8		61.0 - 63.9		61.6 - 67.7		
Minin	num Annual Temperature (°F)	42.3		44.9 - 47.6		45.6 - 51.4		
Annua	al Days with Max Temp over 90°F	1		3-11		4-32		
Annua 32°F	al Days with Min Temp below	105		80 - 94		42-82		
Annua (Base	al Heating Degree-Days :65°F)	5772		4,481 - 5,116	3	703 - 5,003		
Annua (Base	al Cooling Degree-Days 65°F)	486		753 - 1,075		848 - 1628		
Annua (Base	al Growing Degree-Days 50°F)	2,553		3,046 - 3,622	3	201 - 4,574		
October 17, 2018	6	Horsley Witte	n G	iroup				20

nate Projectio	da	Growing season almost publes by end of century		
Table 1: TEMPERATURE PROJECTIONS	Raceline	Mid-Contuny	End of Contum	
Parameter	(1971-2000)	(2050s)	(2090s)	
Average Annual Temperature (°F)	50.6	53.0 - 55.8	53.6 - 59.7	
Maximum Annual Temperature (°F)	58.8	61.0 - 63.9	61.6 - 67.7	1
Minimum Annual Temperature (°F)	42.3	44.9 - 47.6	45.6 - 51.4	
Annual Days with Max Temp over 90°F	1	3-11	4 - 32	
Annual Days with Min Temp below 32°F	105	80 - 94	42 - 82	
Annual Heating Degree-Days (Base 65°F)	5772	4,481 - 5,116	3,703 - 5,003	
Annual Cooling Degree-Days (Base 65°F)	486	753 - 1,075	848 - 1628	
Annual Growing Degree-Days (Base 50°F)	2,553	3,046 - 3,622	3,201 - 4,574	
er 17, 2018	Horsley	Witten Group	-	



Cli	Climate Projections			r # of significant rain its and longer dry periods	Largest increas expected in wit	se is nter
	Martha's Vineyard Basin Climate Parameter	Base (1971-	line 2000)	Mid-Century (2050s)	End of Century (2090s)	/
-	Total Precipitation (inches):					1
	Annual	46	.0 _	45.0-49.8	45.3 - 50.9	1
200	Winter	11	.9	11.5 - 13.5	11.7 - 14.7	
-	Spring	12	.1	11.6-13.9	11.9-14.3	
	Summer	10	.4	9.3 - 11.9	8.5 - 12.0	a thread a state of the
	Fall	11	7	10.5 - 12.6	9.8-12.9	Contraction of the local division of the loc
	Annual Days with Precipitation over 1 inch	7	\ [8-11	8-11	
	Annual Days with Precipitation Over 2 inches	1		1-2	1 – 2	
	Annual Days with Precipitation Over 4 inches	<	'	<1	<1	
	Annual Consecutive Dry Days	1	3	18-20	17 – 22	
0	ctober 17, 2018	sley Witten	Group	0		22





C	Demographics		Significantly lower than statewide	Signifi higher state	cantly r than wide
	Demographic Parameter		Result		/
	Population	1	3,949 people		/
	Age		0-19 = 20%, 20-34 = 25%, 35-64 = 41%, 65+ = 14%	6	/
1000	Income	1	<\$40K = 42%, \$40-60K = 18%, \$60K+ = 40%		
12	% Below Poverty Line		10%		
	Race		White = 87%, Black = 7%, Asian = 1%, Other = 5%	5 /	
	Ethnicity	1	Hispanic = 0%, Not Hispanic = 100%		
	Percent of Population over 65 Living Alone	1	4.8	/	and a state of the second
	Environmental Justice	1	17.6%	/ .	and the second design of the
	Heart Attack Hospitalizations		48.8(age-adjusted rate per 10,000 people)	$^{\prime}$ $^{\prime}$	Similar to
	Asthma Emergency Department Visits		128.8 (age-adjusted rate per 10,000 people)		statewide
	Pediatric Asthma Prevalence		12.9% of all children enrolled in grades K-8		
	Heat Stress Emergency Department Visits		0.0 (age-adjusted rate per 10,000 people)		
1111	October 17, 2018		Horsley Witten Group		24





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H	ealth Im	pacts of Climate Change
2000		
	Extreme Heat	Rising temperatures will lead to an increase in heat-related deaths and illnesses
	Duildoor Air Guality	Rising temperatures and wildfires and decreasing precipitation will lead to increases in ozone and particulate matter, elevating the risks of cardiovascular and respiratory illnesses and death.
	C	Increased coastal and inland flooding exposes populations to a range of negative health impacts before, during, and after events
	Vector-Borne Infection (Lyme Disease)	Ticks will show earlier seasonal activity and a generally northward range expansion, increasing risk of human exposure to Lyme and disease-causing bacteria.
	Water-Related Infection (Vibrio valiations.)	Increases in water temperatures will alter timing and location of Vibrio vulnificus growth, increasing exposure and risk of water-borne illness.
	Food-Related Infection (Salmoneila)	Rising temperatures increase Salmonella prevalence in food, longer seasons and warming waters increase risk of exposure and infection.
	Mental Health and Well-Being	Changes in exposure to climate- or weather-related disasters cause or exacerbate stress and mental health consequences, with greater risk for certain populations.

Hazards	Exacerbated by	Climate	Change

Intense Rain/Flooding	Heat Waves/Extreme Heat
Wind Events	Fire
Hurricanes or Nor'Easters	Drought
Winter Storms (Snow/Wind/Cold)	Coastal Flooding/Storm Surge Sea Level Rise
F. 011	
Extreme Cold	

xample	S	
UCTURE	Main road floods during storms, blocking emergency response.	
RASTRU	Wildfire and high winds resulting in supply chain interruptions. Sever pumo stations become submerged and inoperable.	
OCIETAL	Senior housing without backup generators during heat waves. Residents without access to transportation during hurricane evacuation. Household contamination and sewage mobilization during flooding. Limited areas of refuge in elementary schools during severe weather.	
WIRONMENTAL	Beachfront development reducing protection provided by dunes. Proliferation of subdivisions in wildfire and flood prone areas. Lack of urban tree canopy increasing heat island effect.	
	Horsley Witten Group	



What Types of Actions Could We Take?

Engineering/Construction Protection/Conservation Retreat/Avoidance Preparations/Planning Policy/Regulatory Changes [Short-term, Long-term, ongoing]

Horsley Witten Group

Some Recommendations From Hazard Mitigation Plan for Tisbury

Improve natural defenses to minimize storm impacts (e.g., beach nourishment, dredging, structural reconfiguration of inlets) Retrofit sewer pump stations to increase storm resiliency Reduce flood impacts by identifying and correcting discharges from town and Commonwealth roadways Reduce damaging volume of direct stormwater discharges to beaches and surface waters by infiltration

Increase capacity in adaptation to climate change, by incorporating 25-year storm calculations rather than 10-year volume into regulations and public infrastructure planning

Make long-range plans for public roads vulnerable to Sea Level Rise working with the Joint Transportation Committee



Ground Rules for Discussions

Share the stage: Everyone should have an equal opportunity to talk. Focus: Focus on the questions asked and your group's discussion. Land the Plane: Respect limited time.

Respect: Listen, be honest, and avoid criticizing others' ideas.

One mic: One person speaks at a time.

Phone etiquette. Phones are off or on vibrate, take calls in the hall.

Horsley Witten Group







Tisbury Municipal Vulnerability Preparedness (MVP) Grant Project: CLIMATE CHANGE PROJECTIONS¹

TEMPERATURE

HIGHLIGHTS:

- Temperature increases could make Tisbury feel like present-day Maryland by 2050 and present-day North Carolina by 2100.²
- ✓ By 2050, we could have more than 3 11 times as many very hot days (over 90°F) than we do today.
 By 2100, we could have almost 4 32 times as many.
- ✓ We will have far fewer days with temperatures below freezing.
- ✓ We will have to expend less energy on heating in the winter, and far more on air conditioning in the summer.
- ✓ The growing season will increase by almost 40% by 2050 and could almost double by the end of the century.

Martha's Vineyard Basin Climate Parameter	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Average Annual Temperature (°F)	50.6	53.0 - 55.8	53.6 - 59.7
Maximum Annual Temperature (°F)	58.8	61.0 - 63.9	61.6 - 67.7
Minimum Annual Temperature (°F)	42.3	44.9 - 47.6	45.6 - 51.4
Annual Days with Max Temp over 90°F	1	3 - 11	4 – 32
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Annual Heating Degree-Days (Base 65°F)	5772	4,481 – 5,116	3,703 – 5,003
Annual Cooling Degree-Days (Base 65°F)	486	753 – 1,075	848 - 1628
Annual Growing Degree-Days (Base 50°F)	2,553	3,046 - 3,622	3,201 – 4,574

Table 1: TEMPERATURE PROJECTIONS

http://www.massclimatechange.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-formajor-river-basins. Data is for the Martha's Vineyard Basin, which includes the land area of Tisbury.

¹ Source: Northeast Climate Science Center, 2018. *Massachusetts Climate Change Projections*. University of MA Amherst. Published by MA Executive Office of Energy and Environmental Affairs. January. 213 p. Available at:

² NOAA National Centers for Environmental Information, Climate at a Glance: Statewide Mapping, Average Temperature, published September 2018 from <u>http://www.ncdc.noaa.gov/cag/</u>.

PRECIPITATION

HIGHLIGHTS:

- ✓ Average annual precipitation in Tisbury will increase up to 8% by 2050 and up to 11% by 2100.
- ✓ The largest increases in precipitation will occur in winter.
- ✓ The greatest increase in consecutive dry days will occur in the summer and fall.

Martha's Vineyard Basin Climate Parameter	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Total Precipitation (inches):			
Annual	46.0	45.0 - 49.8	45.3 – 50.9
Winter	11.9	11.5 – 13.5	11.7 – 14.7
Spring	12.1	11.6 - 13.9	11.9 - 14.3
Summer	10.4	9.3 - 11.9	8.5 - 12.0
Fall	11.7	10.5 - 12.6	9.8 - 12.9
Annual Days with Precipitation over 1 inch	7	8-11	8-11
Annual Days with Precipitation Over 2 inches	1	1-2	1-2
Annual Days with Precipitation Over 4 inches	<1	<1	<1
Annual Consecutive Dry Days	18	18 - 20	17 – 22

Table 2: PRECIPITATION PROJECTIONS

SEA LEVEL RISE

Table 3: SEA LEVEL RISE PROJECTIONS

Year	Emissions Scenario	Boston Likely Range (feet relative to mean sea level in 2000)	Woods Hole Likely Range (feet relative to mean sea level in 2000)
2050	Medium	0.8 to 1.4	0.8 to 1.5
2050	High	0.8 to 1.5	0.9 to 1.6
2100	Medium	1.5 to 3.1	1.6 to 3.2
2100	High	2.0 to 4.0	2.1 to 4.1





Tisbury Municipal Vulnerability Preparedness (MVP) Grant Project: SELECTED DEMOGRAPHIC DATA¹

Demographic Parameter	Result
Population	3,949 people
Age	$\begin{array}{llllllllllllllllllllllllllllllllllll$
Income	<\$40K = 42% \$40-60K = 18% \$60K+ = 40%
% Below Poverty Line	10%
Race	White = 87% Black = 7% Asian = 1% Other = 5%
Ethnicity	Hispanic = 0% Not Hispanic = 100%
Percent of Population over 65 Living Alone	4.8
Environmental Justice	17.6%
Heart Attack Hospitalizations	48.8(age-adjusted rate per 10,000 people)
Asthma Emergency Department Visits	128.8 (age-adjusted rate per 10,000 people)
Pediatric Asthma Prevalence	12.9% of all children enrolled in grades K-8
Heat Stress Emergency Department Visits	0.0 (age-adjusted rate per 10,000 people)

¹ Source: MA Dept of Public Health, 2018. MA Environmental Public Health Tracking Community Profile for Tisbury. Report Created on September 27, 2018. 11 pages.

Attachment B: Workshop Handouts

Risk Matrix: Examples of Features that may be identified in this process:

INFRASTRUCTURE

Examples of Vulnerabilities:

- Main road floods during storms, blocking emergency response.
- Power outages during heat waves lead to health concerns.
- Wildfire and high winds resulting in supply chain interruptions.
- Sewer pump stations become submerged and inoperable.

Examples of Strengths:

- Critical road elevated and passable by emergency management
- Hurricane roof installed at school with improved sheltering capacity.
- Hardened utility lines reduce outages due to ice storms.
- Undersized culvert replaced to reduce flooding in key intersection.
- Improvement to communication systems during extreme weather.

SOCIETAL

Examples of Vulnerabilities:

- Senior housing without backup generators during heat waves.
- Residents without access to transportation during hurricane evacuation.
- Household contamination and sewage mobilization during flooding.
- Limited areas of refuge in elementary schools during severe weather.

Examples of Strengths:

- Reliable communications protocols across departments for all employees.
- "Neighbor-helping-neighbor" program aligned with emergency operations.
- Well-supported volunteer organizations (fire, ambulance, CERTs).
- Faith-based and civic groups with hazard preparedness plans.

ENVIRONMENTAL

Examples of Vulnerabilities:

- Beachfront development reducing protection provided by dunes.
- Proliferation of subdivisions in flood prone areas.
- Lack of urban tree canopy increasing heat island effect.

Examples of Strengths:

- Oyster reefs and tidal wetlands help reduce wave damage to property.
- Forested watersheds maintain drinking water supply during droughts.
- Native, vegetated slopes remain stable after intense 24hr rain events.
- Floodplains provide stormwater storage and downstream flood reduction





Tisbury Municipal Vulnerability Preparedness (MVP) Grant Project:

KEY RECOMMENDATIONS FROM 2015 HAZARD MITIGATION PLAN

CATEGORY OF ACTION	RECOMMENDATION	HAZARD
Structural, protection	Beach nourishment, dredging and structural reconfiguration of inlets and inlet protections to improve natural defenses and circulation, in order to minimize storm impacts, particularly to reconfigure the southern jetty at Lake Tashmoo to provide better protection for the town mooring field and private boatyard in the pond; vegetation management for dune restoration.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge
Structural	Dredging in the harbor to provide better access to critical harbor facilities in the event of a storm and for storm damage prevention.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge
Structural	Retrofit main sewer pump station and generator in town parking lot on Water St. for storm resiliency and sea level rise.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Structural	Retrofit sewer pump station in Steamship Authority (SSA) lot for resiliency.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Prevention	Develop a prognosis and suitable plan for Beach Road and the adjacent seawall.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Prevention	Ensure that outdoor storage materials are secured from creating a flood hazard.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Structural	Reduce flood impacts by identifying and correcting discharges from town and Commonwealth roadways where they cross streams, including: Smith Brook in 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.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding

CATEGORY OF ACTION	RECOMMENDATION	HAZARD
Structural	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	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Prevention	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.	Drought, Fire
Structural	In order to reduce the impacts of drought and wildfire, install new public water supplies and water supply lines within the State Forest	Drought, Fire
Structural	In order to lessen the impacts of drought and wildfire, establish plans and build infrastructure for water supply needs to alleviate future drought emergencies. The Town of Tisbury, nearly at buildout, should focus its attention on redundancy plans in response to potential emergencies such as drought or wildfire.	Drought, Fire
Structural	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.	Drought, Fire
Structural, prevention	Increase capacity in adaptation to climate change, by incorporating 25-year storm calculations rather than 10-year volume into regulations and public infrastructure planning.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Adaptation	Work with the Joint Transportation Committee to make long-range plans for public roads vulnerable to Sea Level Rise.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding

SOURCE: Hazard Mitigation Plan For Seven Towns in Dukes County 2015

EXISTING PROTECTIONS FROM 2015 HAZARD MITIGATION PLAN

TYPE OF EXISTING PROTECTION	DESCRIPTION	HAZARD
Town participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located in flood-prone areas.	Hurricanes and Nor'Easters, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Floodplain District Zoning Bylaw	Requires Flood Plain Permit for new construction, substantial improvement; addition of increased water, electric or septic systems to conform to rules and regs of Board of Health; alteration of landforms by Special Permit from ZBA; within V-Zone new construction to be located landward of Mean High Water; within AO zones residential structures elevated.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Coastal District DCPC (District of Critical Planning Concern)	height and construction standards for inland zone, including site plan review, may be modified by special permit from ZBA; no residential construction in shore zone; Special Permit by ZBA in shore zone for nonresidential structures or for additions to existing residential structures < 500 sf with no increase in plumbing or septic; septic 200' from salt water body; minimum separation 200' between septics; septics at least 5' above groundwater; septics 600' from public water supply and 200' from private well; private well 200' from salt water body; no road > 10' except by special permit.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Lagoon Pond DCPC	Density restrictions; pier regulations.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Fire Wise Outreach	Outreach and response person on Martha's Vineyard 24/5; outreach to groups and available for response.	Fire
Structural protection, emergency services	Relocation of Fire/Ambulance Departments out of floodplain	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Emergency Services	Land purchase for new Emergency Services facility out of floodplain.	Hurricanes and Nor'Easters, Sea Level Rise, Coastal Flooding, Storm Surge, Intense Rain/Flooding
Structural, protection	Hardened utilities – electric lines on Main St, Union St., Beach St., and Water St.	All Hazards
Emergency Services	Generator for Tisbury School, which is the primary shelter in town.	All Hazards
Emergency Services	foam trailer for fighting ethanol-based fires.	Fire

SOURCE: Hazard Mitigation Plan For Seven Towns in Dukes County 2015

COUNTY WIDE GOALS FROM 2015 HAZARD MITIGATION PLAN

- Protect critical public facilities and services from damage due to natural hazards.
- Ensure that critical infrastructure is protected from natural hazards.
- Promote strong natural shore defenses such as coastal beaches and dunes.
- Improve circulation for tidally restricted harbors, ponds and marshes.
- Develop programs and measures that protect residences and other structures from natural hazards.
- Develop mitigation strategies that consider area businesses, including marinas, and protect the economic vitality of the region.
- Protect and preserve irreplaceable cultural resources, particularly for recreation, located in hazard-prone areas.
- Support the communities with information concerning hazard mitigation funding opportunities, and assist the communities in the identification and development of specific mitigation projects.
- Increase each town's capacity for responding to a natural hazard event by promoting the adequate provision of emergency services capabilities.
- Increase awareness and support for natural hazard mitigation among municipalities, private organizations, and area residents through outreach and education.
- Discourage future development in vulnerable areas and encourage restoration of vulnerably-developed properties to more natural and defensible conditions or to open space.
- Reduce vulnerability to drought, by improving water supply infrastructure and by encouraging conservation measures such as low-maintenance landscaping.
- Support greater resiliency by developing and implementing climate change adaptation strategies.

SOURCE: Hazard Mitigation Plan For Seven Towns in Dukes County 2015

Attachment C: Tisbury Base Maps

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Attachment D: All Groups – Completed Risk Matrices

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Community Resilience Build	ling Risk	Matrix		Group 1 www.CommunityResilienceBuilding.org						
Location = Mark on the map, note on matrix Multi	ple, Specific or T	ſown-Wide		Top Priority Hazards (floods,	op Priority Hazards (floods, wildfire, hurricanes, drought, sea level rise, heat wave, etc.)					
\underline{V} = Vulnerability \underline{S} = Strength Type of Feature = Infrastructural. Societal. or Envi	ronmental							Priority	Time	
High, Medium, or Low priority for action over the	Short or Long t	erm (and <u>O</u> ngoin	g)	Hurricane/Nor' Easter	Intense Rain/Storm Surge	Coastal Flooding	Sea Level Rise	<u>H</u> - <u>M</u> - <u>L</u>	<u>Short</u> Long Ongoing	
Infrastructural	LUCATION	Owner	<u>v or 5</u>							
Beach Road flooding	Beach Road	State	V	Install breakwater	Elevate road/buildings	Seawall				
Water Street	Water Street	Town	v	Capture runoff from uphill	Increase drainage pipes	Seawall	Divert runoff/groundwater recharge			
Lagoon Pond Rd	Lagoon Avenue	Town	v	Increase culvert at Lagoon Pond bridge	Increase drainage					
Union Street (Detour)	Union Street	Town	S							
Police Station	Water Street	Town	v	Relocate	COOP - update					
Sewer pump station		Town	v	Waterproof						
Above-ground power distribution		Private	v	Tree trimming	Private road access					
Fuels		Private	v	Storage capacity	Renewable energy					
Packer barge mooring	Tashmoo	Private	s							
Eversource Response			s							
VTA			S							
Trees			v	Tree trimming						
Docks - Owen Park			v	Elevating dock	Seawall					
Private roads			v	Town regulations						
Streamship Authority			S/V		Seawall					
Communications/hard lines			v	Tree trimming						

Community Resilience Build	ding Risk	Matrix		Group 1		www.CommunityRe	ww.CommunityResilienceBuilding.org			
		147: J		Ton Priority Hazards (flood	s wildfire hurrisanes drought so	a loval risa haat waxa ats)				
\underline{V} = Vulnerability \underline{S} = Strength	ipie, Specific or 1	own-wide		Top Fridity mazarus (1000	s, whathe, numeates, drought, se	ea level lise, lieat wave, etc.)		Priority	Time	
Type of Feature = Infrastructural, S ocietal, or E nvironmental High, M edium, or L ow priority for action over the S hort or L ong term (and O ngoing))	Hurricane/Nor' Easter	Intense Rain/Storm Surge	Coastal Flooding	Sea Level Rise	H - M - L	<u>Short</u> Long	
Features	Location	Owner	<u>V</u> or <u>S</u>						<u>U</u> ngoing	
Societal	-								-	
Grinder Pump Station Ind.			v	Education						
Vulnerable population list			S	Update on a regular basis	Education					
Elderly housing	Various areas		V	Back-up generators			Comprehensive stormwater study			
Private road impassable			V	Tree trimming	Road maintenance for emergency access	Regulations				
Public awareness			V	Education/trifolds			1			
Aging population			V							
Affordable housing			V							
Community and faith-based organizations			S							
Elderly housing ERP			S							
Environmental										
Coastal development			v	Breakwater	Hazard Mitigation Plan		Seawall			
Veteran's Park, flooding with water drainage			S							
Extending Eastville Jetty			S	Breakwater						
State road regulation			V	Hazard Mitigation Plan						
North shore wetlands			S							
Sewage overflow			V	Study						
Inner harbor			V	Study						

Community Resilience Build	ling Risk	Matrix		Group 2 www.CommunityResilienceBuilding.org						
Community Residence Duri	ing non	- iuu in		dioup 2						
Location = Mark on the map, note on matrix Multi $\underline{\mathbf{V}}$ = Vulnerability $\underline{\mathbf{S}}$ = Strength	ple, Specific or 'l	Γown-Wide	Г	Top Priority Hazards (floods, wild	dfire, hurricanes, drought, sea level ris	se, heat wave, etc.)		Priority	Time	
Type of Feature = <u>Infrastructural</u> , <u>Societal</u> , or <u>Envi</u> High, <u>Medium</u> , or Low priority for action over the	ironmental Short or Long t	erm (and O ngoing	1)	Intense Rain/Flooding	Hurricanes/Nor' Easters	Coastal Flooding/Storm Surge	Sea Level Rise		<u>S</u> hort <u>L</u> ong	
Features	Location	Owner	<u>V</u> or <u>S</u>					H-M-L	<u>O</u> ngoing	
Infrastructural										
Steamship Authority Terminal	Terminal	State/Town	V/S		Raise Water Street from I	Five Corners to Union Street		Н	*	
Waterfront Commercial District		Private	V/S		Raise Water Street from Five Corners to Union Street					
Vineyard Haven Harbor		Public/private	V/S		Extending brea Hardening Beach Road (Ti	kwater (Eastville) sbury Wharf to Shell Station)		Н	*	
Wastewater pump station	SSA	Public/private	v		Project i	in progress				
Stormwater drainage system (collectively)	All	State/Town	v	Со	ntrolling runoff, porous pavement, reduc	e state road runoff, upstream retention a	eas	Н	*	
Electrical system (communication, power)	West Chop, Lagoon Pond Rd, Northern Pines	Town/private	v		Bury main lines in most vulnerable areas					
Navigational channels (Tashmoo, harbor and lagoon)		Town/state/fed eral	v		Tashmoo - extending jetties to mitiga	te the need for dredging, naturalizing it				
Beach Road		State	v		Raise existing seawall between bridge to RM Packer's property					
Lagoon Pond Road		Town	v		Needs to be raised					
Water Street*		Town	v					н		
Post office	5 Corners	Federal	v		Relocate post office					
Police station	Water Street	Town	v		Reloca	te station				
Harbor Master's Office	Owen Park	Town	v		Redesign to r	nake it resilient				
RM Packer's Terminal	Beach Road	Private	v		Raising seawall and ex	xtending jetty (Eastville)				
Societal										
Disruptions to post office, RM Packer (fuel)supply chain, SSA	5 Corners, Water Street	Federal/State	v		Warehousing at airport (regional)), i.e., energy, fuel, propane, batteries		н	*	
Disruption - power cable from mainland to island	Harbor	Private (Eversource)	v							
Police station - response	Water Street	Town	v		Reloca	te facility	·	Н		
Propane and fuel delivery	SSA	Private	v					Н		
Public transportation - VTA	All roads	Public	v		Backup hub at	alternative sites	·			
Gas stations	Beach Road	Private	v					Н		
Emergency shelter	Oak Bluffs	Public	V/S	Currently at Oak Bluffs Elementary Sc	chool, regional agreement, better commu community outrea	nication between emergency managemen ch, alternative routes	t directors and public, communication,	Н	*	
Access to hospital	Multiple roads	s State	v	creating additional point	ts of access to hospital (identify alternativ	ve routes to critical facilities), address imp	rovements to Beach Road	Н		
Recreational facilities	Veteran's Park	Town	v		Access, stormwater retention, re	elocating what would be displaced				
Solar array alternative energy sources and storage (energy)	Landfill	Town/private	s	Redirectir	ng energy to batteries at various location	s (storage), increase generator capacity (E	versource)	Н	*	

Community Resilience Building Risk Matrix				Group 2 www.CommunityResilienceBuilding.org					
Location = Mark on the map, note on matrix Multi	ple, Specific or '	Гown-Wide		Top Priority Hazards (floods, wild	fire, hurricanes, drought, sea level ris	se, heat wave, etc.)			l
\underline{V} = Vulnerability \underline{S} = Strength Type of Feature = Infrastructural, Societal, or Env	ironmental		ſ					Priority	Time
High, Medium, or Low priority for action over the Features	Short or Long te	erm (and Ongoing	^{g)} V or S	Intense Rain/Flooding	Hurricanes/Nor' Easters	Coastal Flooding/Storm Surge	Sea Level Rise	H - M - L	<u>Short</u> Long Ongoing
Communications (landline, cell), infrastructure	Locator		10.2					<u> </u>	<u> </u>
support		Town/private	v						4
Reverse 911 system	Island-wide	Public/private	v		Unified mass system not	ification that is consistent			
Emergency services volunteers		State/Town	V/S		Promote community outre	each for younger generation			
Neighbor-to-neighbor (cultural)	Island-wide	Town	S						
Demographic changes		Town	v		Unified mass system not	cification that is consistent			
Economy and tourism		Town	S		Coordinate with Chamber of Co	ommerce - packet for new comers			
Environmental									
Wetlands, marsh lands	Coastal area	Town	v		Detailed (enhanced) mapping	g, artificially building up marsh			
Shellfish, fin fish nurseries	Lagoon Pond, Lake Tashmoo, Outer Harbor	Town	v		Identify potential industry adaptations				
Development in flood zones	West Chop to Tashmoo	Private	v		Addressing stormwater and access issues				
Beach erosion	Northeast facing West Chop	Private	v		Identifying beach eros	sion on public properties			
Vegetation (land and water)	Coast		v	Land: pl	anting trees (climate adaptive), shade tre	ees in downtown area, Sea: aquaculture (:	seaweed)		
Ocean acidification	Island-wide		v						
Island food production, agricultural changes	West Tisbury, Chilmark, Edgartown	Private	S						
Natural resources of food, hunting: deer/fishing	Island-wide	Public/private	V/S		Proactive and adaptati	ion re: natural resources			
Evacuation	Island-wide	Town/State	v						
Waste removal	Town-wide	Town	v	More on	island - composting (industrial level) to	reduce what goes off island, recycling, rep	purposing	Н	
Water supply					Protecting zones of	f contribution (1,2,3)			
Sole source aquifer		Town	S		Protecting zones of	f contribution (1,2,3)			
Power Company - Eversource	Island-wide	Private	v		Burying ma	in power line			
Workforce (off island), XXXXX, tradesmen	Island-wide	Private	v		Become less dependent, increase educ	cational opportunities, increase housing			

Attachment D: All Groups - Completed Risk Matrices

Community Resilience Building Risk Matrix				Group 3 www.CommunityResilienceBuilding.org					
Location = Mark on the map, note on matrix Multiple, Specific or Town-W $\underline{\mathbf{V}} = $ Vulnerability $\underline{\mathbf{S}} = $ Strength	'ide			Top Priority Hazarus (floods, wildfire, hurr	icanes, drought, sea level rise, nei	at wave, etc.)		Priority	Time
High Medium, or Low priority for action over the Short or Long term (an	d Q ngoing)		1	Coastal Flooding/Storm Surge	Sea Level Rise	Hurricanes/Nor' Easters	Intense Rain/Flooding	H . M . I	Short Long
Features	Location	Owner	<u>V</u> or <u>S</u>					п.н.г	<u>O</u> ngoing
Infrastructural						•			
Beach Road at 5 Corners, Water Street		Public			Elevate Roads and buildin	igs 10 ft, relocate or raise			
Steamship Terminal - wind		Private	v		Relocate Steamshi	p - Eastville Beach			
Lagoon Pond Road	Hines Pt.	Public	v		Multiple layers - top is func	tional level of usable space			
Packer Wharf - gas and oil	Beach Road	Private	v		Protect	or raise			
Electrical service		Public	v		Explore and map bury or harden w	vires - buried wires after winds up			
Herring Creek Road	West Chop, Minic Meadow	Public/private	v						
Septic and sewer	Flood zones	Public	v	U	lse similar system as Edgartown - ele	vate/vault/protect using grant money			
Major pump station	Stop and Shop	Public	v		Protect	or raise			
Food - Stop and Shop	5 Corners	Private	v		Elevate o	r relocate			
VTA Terminal - Node	5 Corners	Public	v		Public support to improve infr	astructure - invest to preserve			
Secondary route to hospital	Barnes Road	Public	v	Public/private partnership to incentivize move to high ground for essential services					
Drawbridge requires power		Public	v	Repla	Replace - habitat restoration and raised infrastructure, drainage and new waterfront				
Police Department in flood zone		Public	v						
Town Hall and emergency services high			S						
Landfill high			S						
Evacuation centers on hill			S						
Above ground electrical		Public	v						
NSTAR advances teams to help		Public	s						
Steamship Generator		Public	S						
Electrical cable to West Chop		Public	S						
New lines on VH and EDG Rd		Public	S						
Hospital generator		Private	S						
Generators for sewer and municipal buildings		Public	S						
No shelters in V.H.	School	Public	v	More	e Red Cross volunteers to staff, educat	te about other spaces and staffing options			
Dependency on mainland for food and resources			v		Revegetation also cleans water				
Airport		Public/County	S						
Evacuation route and mode			v						
Storm drains run downhill empty into 5 corners and problem harbor areas				Recycle or redistribute runoff and water - po	wer source?, Veteran's Park as water environmen	retention area, divert or redirect away from flood ntal benefit	zone towards bioretention for		

Attachment D: All Groups - Completed Risk Matrices

Community Resilience Building Risk Mat			Group 3 www.CommunityResilienceBuilding.org						
Location = Mark on the map, note on matrix Multiple, Specific or Town-W	'ide			Top Priority Hazards (floods, wildfire, hurricanes, drought, sea level rise, heat wave, etc.)					
$\underline{\mathbf{Y}}$ = Vulnerability \mathbf{S} = Strength Type of Feature = Infrastructural, <u>S</u> ocietal, or <u>E</u> nvironmental High <u>Medium or Low priority for action over the Short or Long term (an</u>	d O ngoing)							Priority	Time
Features	Location	Owner	V or S	Coastal Flooding/Storm Surge	Sea Level Rise	Hurricanes/Nor' Easters	Intense Rain/Flooding	H - M - L	Short Long Ongoing
Societal									1
Agreement with Packer - Red Cross	Waterfront	Private	S						
Two thousand workers commute via ferry	Harbor		v		Housing contingency for short te	rm housing of essential services			
Off-island workforce		Private	v						
Meals on Wheels comes from hospital			v	Alte	rnative transportation, boats, special	lized vehicles - duck boats, snowmobiles			
Access to shelters - senior housing			v		Improved communications - emer	rgency network - dispatch system			
Medicine, food, staples		Public/private	v						
Airport - Red Cross supplies		Public	S						
Regional focus and planning	AG Hall etc		S						
Gateway for all workers, food, etc			v	Use airport and AG Hall as hub, fly in	supplies (county, FAA etc may alread	ly have plan); organize town, county and empowe	r emergency managers		
Red marker on homes for seniors			S						
Strong support and organizations			S						
Strong educational programs for community	Red Cross		S						
Population surge - 100K a day			v	Parking	plan for vehicles stranded and shut	des, ping, 211, social media to communicate			
Shelter system			S						
Communications (without cell)			v						
Evacuation planning - what's been done? Routes, modes, plan(?)			V/S						
Real estate development, in flood zones especially			S						
Take advantage of high ground			S		Move essential services to l	high ground - High Pont Rd			
Animals and pets - DART Program			S						
Environmental									
Gas and oil leaks	Beach Road	Private	v		Require business to exceed federal	standards to address local concerns			
Barrier beaches	Herring, Tashmoo		s						
Trial oyster reefs: lagoon, Eastville	No Shore, Eastville, Owen Ltle		S		Climate change educ	ration, sustainability			
Erosion	Lagoon Pond	Private	v		Personal habits - o	electric cars, solar			
Geography conducive to "Dutch" mitigation	Tashmoo and harbor		S		Restoration of marsl	nes, oyster reef balls			
Two safe harbors	Lagoon Pond, Lake Tashmoo		S						
Filled marsh - floods	Tisbury Marketplace		v						
Displacement area	Veteran's Park		S						
Water supply on high ground	High Point		S						
Shellfish stock - farming	W Spring St		v		Diverting wat	ter, runoff, no			

Community Resilience Building Risk Matrix				Group 4 www.CommunityResilienceBuilding.org						
Location = Mark on the map, note on matrix M	Multiple, Specific (or Town-Wide	9	Top Priority Hazards (floods, wildfire, hur	ricanes, drought, sea level rise, heat wave, etc.)					
\underline{V} = Vulnerability \underline{S} = Strength Type of Feature = Infrastructural, Societal, or Environmental								Priority Time		
High, Medium, or Low priority for action ove Features	r the <u>S</u> hort or <u>L</u> or Location	ng term (and <u>C</u> Owner	Dingoing)	Intense Rain/Flooding	Intense kain/Piooding Hurricanes/Nor Easters Coastal Piooding/Storm Surge Sea Level Rise					
Infrastructural					ł				1	
Beach Road			v		Beach Road reconstruction/beach renourishment fro	om dredging, local maintenance (on-going)		8		
Steamship Concrete Structure			v	Future plan? Rebuild p	Future plan? Rebuild plan? Time to return to operation. Identify timeframe - how to cover gap - vulnerability assessment, public knowledge					
Beach Road Sewer			v					4		
Fuel storage			s							
Building codes/zoning, flooding/wind damage, future			v		Strategic retreat - marine oriented recon transfer development rights					
Wind velocity/building codes										
Inner harbor structures on coast, vessels			v							
Breakwater porosity and height			v	Additional breakwa	ter 400 - 500' at Eastville Beach. Extend existing brea	akwater. Recon. to increase height at back cha	nnel breakwater.	10, 3		
Eastville Jetty to protect harbor and coastal areas				Additional breakwater 400 - 500' at Eastville Beach.						
Pump station at Stop and Shop			v		Assess and floodplain compliant - retrofit safeguards and temp backup					
Societal				-						
Steamship			v							
Supply chain			v	Short and long rehabilitation goals/actions plan if the depot docks go down - what is the action plan to get supplies? What to do. How to do it. Back up generators.						
Hospital			v							
School shelter			s							
Fuel storage			s							
Water quality/shellfish, economy			v		BMPs to reduce nitrogen and phosphorus	and fecal Coliform and bacteria		4		
Health - mold in homes, dampness			v							
Hospital, 7 days operation			s							
Assessment of emergency shelter program	Tisbury School		s							
Communication - on-island and off-island options, code red reverse 911			V/S	Oak Bluff Elementary shelter (regional) vs. Tisbury Elementary School (local), how to know where to go, emergency manager to announce each winter shelters and access, pets?						
Safety and awareness										
Accessible policy makers/politicians				language barrier, disabilities, elderly - limited mobility						
Streamline permitting process for navigation and coastal defense										

Community Resilience Building Risk Matrix				Group 4 www.CommunityResilienceBuilding.org							
Location = Mark on the map, note on matrix M	ultiple, Specific o	or Town-Wide		Top Priority Hazards (floods, wildfire, hurricanes, drought, sea level rise, heat wave, etc.)							
$\underline{\mathbf{v}}$ = vulnerability $\underline{\mathbf{s}}$ = strength Type of Feature = <u>I</u> nfrastructural, <u>S</u> ocietal, or	<u>E</u> nvironmental							Priority	Time		
<u>High, M</u> edium, or <u>Low priority for action over</u>	the <u>Short or Lor</u>	ng term (and <u>0</u> Owner	ngoing)	Intense Rain/Flooding	Hurricanes/Nor Easters	Coastal Flooding/Storm Surge	Sea Level Rise	Н - М - L	<u>Ongoing</u>		
Environmental	Location	onner	Torp								
Coastal buffers			v								
Fuel storage			v								
Private septic systems			v								
Public water supply, surrounding green space			s	Capacity study to support future development							
Water quality/shellfish			v								
West Chop natural wetland to absorb flooding			s								
Drainage at Lagoon Pond Road and 5 Corners				Stor	nwater system maintenance - deferred - needs accour	ntability - current O&M guide - improve draina	ze	6			
Shellfish harvesting				Raise awareness (signage and education) - create controlled access at Clam Shack Marsh - salt marsh restoration and debris removal							

Attachment F: All Groups - Recommended Action Items

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Community Resilience Buildi	ng Risk I	Matrix		Recommended Acti	on Items	www.CommunityRe	silienceBuilding.org					
Location = Mark on the map, note on matrix Multiple	e, Specific or To	wn-Wide		Top Priority Hazards (floods, wi	ildfire, hurricanes, drought, s	sea level rise, heat wave, etc.)						
<u>V</u> = Vulnerability <u>S</u> = Strength Type of Feature = <u>I</u> nfrastructural, <u>S</u> ocietal, or <u>E</u> nviro					Coastal Flooding/Storm		Group	Priority	Time			
High, Medium, or Low priority for action over the Short or Long term (and Ongoing)				Intense Rain/Flooding F	Hurricanes/Nor' Easters	Surge	Sea Level Rise	1-4	<u>H</u> - <u>M</u> - <u>L</u>	<u>Short</u> Long <u>O</u> ngoing		
Infrastructural	Location	owner										
Waterfront area flooding	Waterfront	Public/Private	V	Complete a comprehensive stormwater study								
Northside (Eastville) Breakwater	Eastville		v	Extend the	Extend the north side (Eastville) beach water to protect Beach Road and the harbor							
Beach Road Seawall	Beach Road	State	v		Harden the Beach Road seawall							
Harbor protection	Waterfront		V	I	Extend northside (Eastville) breakwater to protect the harbor.							
Downtown roads vulnerable to flooding	Waterfront		v	Initiate roadway improvements to imp Water Street from 5 Corners to Union S	tiate roadway improvements to improve resiliency to coastal flooding, storm surge and sea level rise including, but not limited to: Iter Street from 5 Corners to Union Street, Beach Road from 5 Corners to the Bridge, and Lagoon Pond Road to Hines Point.							
Stormwater network	Townwide	Town	V	Increase retenti	ion areas to reduce flows to lov	v areas, porous pavement, green in	rastructure	2	Н			
Downtown area including Steamship Authority - 5 Corners - Beach Road	Waterfront	Public/Private	V	Raising roads and improving drain purch	Raising roads and improving drainage, incentivizing the movement of facilities to higher ground (especially essential services) and purchasing properties to mitigate affects of floods and coastal resiliency.							
Drainage network	Townwide	Town	V	Redirecting and/or diverting stormw	edirecting and/or diverting stormwater to bioretention systems in key areas to avoid flooding and pollution of harbor and waterways.							
Secondary Transportation Hub	Townwide	Town	V	Identify a secondary transportation	Identify a secondary transportation hub for use in ensuring that essential items can get to the island and provide for storage and distribution of commodities.							
Breakwater at Eastville	Eastville		V	Extent the north side (Eastv	Extent the north side (Eastville) beach water to protect Beach Road and the harbor							
Beach Road reconstruction	Beach Road	State	V		Complete beach renourishment with local dredge materials.							
Pump station at Stop and Shop	Waterfront	Town	V	Assess and retrofit the pump station at Stop & Shop to mitigate against problems during power outages.								
Societal												
Hazard Mitigation Planning	Townwide		V	Update the Tisbury Hazard Mitigation Plan to identify improvements to mitigate vulnerabilities associated with stormwater, electrical network, breakwater, seawall, police station, properties, Lagoon Pond bridge culvert, sewer pump station, etc								
Education and Community Outreach	Townwide		V	Review current regulations, medical dependent population information, sewage, food/water/fuel, evacuation/shelter, tree trimming/brush, private road maintenance, preparedness/response/recovery and identify ways improve community outreach.								
Supply chain	Townwide		V	Increase energy storage (batteries from solar array), commodity resilience								
Communications	Townwide		V	Create a unified mass notification system, review emergency shelter plan, increase coordination between the town and emergency management, increase community outreach and share information about alternate travel routes.								
Emergency Shelters	Townwide		V	eview current emergency sheltering plans to ensure that they are viable for all incidents and accommodate both local citizens, off-island workforce and tourists.								
Supply Chain Action Plan & Steamship Authority Vulnerability Assessment	Townwide		V	Complete a comprehensive vulne	Complete a comprehensive vulnerability assessment to identify supply chain vulnerabilities and identify mitigation measures.							
Emergency Manager Communications	Townwide		V	Increase communication and coordination between emergency management, town officials and the public. 4 H								
Environmental												
Environmental regulations	Townwide		V	Review current regulations to a	determine ways to determine v environmentally sensitive area	ways to improve and mitigate the in as (e.g., wetlands, coastal areas).	npacts of climate change in	3	Н			

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Attachment G: High Priority Action Items

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Community Resilience Building Risk Matrix			High Priority Action Items www.CommunityResilienceBuilding.org							
Location = Mark on the map, note on matrix Multiple, Specific or Town-Wide \underline{V} = Vulnerability \underline{S} = Strength			Top Priority Hazards (floods, wildfire, hurricanes, drought, sea level rise, heat wave, etc.)							
Type of Feature = Infrastructural, <u>S</u> ocietal, or <u>E</u> nvironmental						Coastal Flooding/Storm Surge	Sea Level Rise	Group	Priority	Time
High, Medium, or Low priority for action over the Short or Long term (and Ongoing)				Intense Rain/Flooding	Hurricanes/Nor' Easters			1-4	H - M - L	<u>S</u> hort <u>L</u> ong <u>O</u> ngoing
Infractructu	ral	Owner	<u>v 01 5</u>							
Waterfront area										
flooding	Waterfront	Public/Private	V	Develop a comprehens	sive stormwater manag	Multiple	Н	S - L		
Harbor protection	Waterfront		v	Identify and initiate ha downtown areas and t	Identify and initiate harbor improvements (e.g., breakwater extensions) to protect downtown areas and the harbor.					L
Downtown roads vulnerable to flooding	Waterfront		V	Initiate roadway impr sea level rise including Beach Road from 5 Co	ovements to improve re g, but not limited to: Wa rners to the Bridge, and	Multiple	Н	S - L		
Societal										
Hazard Mitigation Planning	Townwide		V	Update the Tisbury Ha with the stormwater r seawalls, police station station, etc	1	Н	0			
Education and Community Outreach	Townwide		V	Identify ways to improve and increase community education and outreach with regards to climate change hazards, emergency preparedness and evacuation and sheltering options.					Н	0
Supply Chain Action Plan & Steamship Authority Vulnerability Assessment	Townwide		v	Complete a comprehe vulnerabilities and de	nsive vulnerability asse velop mitigation measu	2, 4	Н	S - L		
Environmental										
Environmental regulations	Townwide		V	Review Town regulati climate change.	ons and identify change	es that could mitigate fu	ture impacts of	3	Н	0

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Attachment H: November 8, 2018 Public Listening Session Summary

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On November 8, 2018 the Town of Tisbury held a public listening session from 7:00 p.m. – 8:30 p.m. at the Tisbury Senior Center located at 34 Pine Tree Road in Vineyard Haven, MA 02568. There were 27 people in attendance. Will Keefer, MVP certified facilitator from HW, gave a presentation that provided an overview of the MVP Program, the MVP Workshop development and facilitation process and introduced seven high priority action items developed as part of the October 17, 2018 workshop.

The public listening session provided an opportunity for those that were involved in workshop, as well as the public in general to help



Figure 1: Public Listening Session Networking

refine the draft high priority action items developed as a result of the workshop. The general sentiment of the audience was that the action items should be fairly broad in scope so that the community could engage others in determining specific projects that best suited the town's needs into the next century. For example, an original action item focused on extending the northside (Eastville) breakwater; however, several individuals pointed out that this option was just one of many that have been proposed, so further study was warranted before choosing a final option to pursue. Additional suggestions that resulted from the listening session included, in no particular order:

- Provide guidance to homeowners regarding grinder pump operation and noting that during an electrical outage they will not work.
- Verify that current plans to protect the wastewater pump station at Stop & Shop take into account climate change hazards.
- Review previous studies (e.g., 1980 breakwater option study) related to harbor protection options when determining the most appropriate project to undertake.
- Consider planning for more extreme climate change scenarios rather than mid-range scenarios to ensure that projects are viable 100 or more years in the future.
- Ensure that supply chain vulnerability assessments include the Steamship Authority and that assessment includes information captured in other relevant assessments.
- Involve the Martha's Vineyard Commission (<u>http://www.mvcommission.org</u>) in the project development phase.
- Ensure that once all towns on Martha's Vineyard have become MVP-certified that representatives get together to identify common goals and coordination opportunities.
- Consider meeting with representatives from Nantucket to determine if there are any coordination opportunities.
- Identify critical facilities currently in floodplains that could be moved (e.g., police station, post office) and or have operations relocated if temporarily unavailable (e.g., Continuity of Operations Planning).
- Identify fuel storage options and locations.
- Determine facility generator fuel storage capabilities at critical town facilities.
- Ensure projects are also included in the Dukes County Hazard Mitigation Plan.

Attachment H: November 8, 2018 Public Listening Session Summary

- Consider land purchases to provide more open space to collect stormwater runoff and serve as a coastal buffer.
- Consider prioritizing the high priority actions further when determining what projects should be proposed for grant opportunities.
- Overhead electrical wire vulnerabilities should lead to future initiatives to bury electrical lines where possible, particularly along Beach Road.
- Future sea level rise may result in coastal properties no longer being insurable.
- Future sea level rise may eventually require businesses in the downtown area to relocate to higher ground, which may necessitate the need to develop a secondary commercial area.
- Consider developing shelter-in-place plans for the community for those who would not evacuate due to a natural disaster (e.g., hurricane). Ferries can only transport a limited number of cars, so the majority of people who may try to evacuate would be left without their own transportation and would have to rely on public transportation in Woods Hole.

In addition, there were several unanswered questions resulting from the listening session that should be followed up on:

- What types of projects have the MVP grants funded in other communities?
- What other types of grants could projects related to the seven high priority action items be eligible for?
- Does sea level rise and coastal flooding impact development that has been built on fill differently than development on regular land?

In closing the public listening session, the MVP facilitator confirmed that the final October 17, 2018 Tisbury MVP Workshop summary report would be available for the public to review upon completion.

As a result of the public listening session, the core planning team incorporated suggestions from the public and confirmed the following seven high priority action items, in no priority order:

- 1. Conduct a comprehensive supply chain vulnerability assessment.
- 2. Identify and initiate harbor improvements (e.g., breakwater extensions) to protect downtown areas and the harbor.
- 3. Identify and undertake roadway improvements that improve resiliency to coastal flooding, storm surge and sea level rise in locations including, but not limited to:
 - Water Street from 5 Corners to Union Street.
 - Beach Road from 5 Corners to the Bridge.
 - Lagoon Pond Road from 5 Corners to Hines Point.
- 4. Develop a comprehensive stormwater management plan for the community.
- 5. Review and update the Tisbury section of the Dukes County Hazard Mitigation Plan.
- 6. Increase community education and outreach with regards to climate change hazards, emergency preparedness and sheltering options.
- 7. Review Town regulations and identify changes that could mitigate future impacts of climate change.