Community Resiliency Building Workshop Summary of Findings

TOWN OF SOMERSET, MA

MUNICIPAL VULNERABILITY PREPAREDNESS

JANUARY 2020

Dewberry

The Municipal Vulnerability Preparedness Plan is dedicated in memory of Chief J.
We Will Forever Miss
Our Dear Friend
Chief Scott Jepson
Whose Dedication and Commitment
Was Unsurpassed.
The Impact You Made Here
Is “HUGE” and
Will Be Felt For Many Generations

Acknowledgements

The Municipal Vulnerability Preparedness Plan was prepared over a six-month period through a process of public and private stakeholder participation. Special thanks to the Core Team, who guided the development of the MVP Plan.

MVP CORE TEAM

Richard Brown, Town Administrator
Chief Jepson, Fire Chief and Emergency Manager
Chief O'Neil, Police Chief
Paul Boucher, Building Commissioner and Zoning Enforcement Officer
Tim Turner, Conservation and Board of Health Agent
Bob Bozikowski, Water and Sewer Superintendent
Barry Fontaine, Recreation Director
Shauna Geary, Council on Aging Director
Jeffrey Schoonover, Somerset Public School Superintendent
Nancy Durfee, Town Planner

WORKSHOP STAKEHOLDERS

Bill Napolitano, SRPEDD Environmental Program Director
Brian Murphy, Hub International, Town's Insurance Agent
Matt Talbot, High School Science Coordinator/Environthon
Tony Kucikas, Council on Aging, Chairman
Ann Malley, National Grid Community Representative
Peter Duclos, Gladding Hearn, President
David Janik, Coastal Zone Management, Southeast Coordinator
Rachel Fleck, MEMA Region 2, Local Coordinator and Red Cross Specialist
John McNulty, General Manager, Patriot Stevedoring
Elaine Pereira, Environmental Compliance, Brayton Point LLC
Ted Wheeler, Site Manager, Brayton Point LLC

The Town and Core Team Members would like to thank the Somerset participants, community members and key stakeholders that contributed towards the development of the Municipal Vulnerability Preparedness Plan.

Table of Contents

Overview 1
About Somerset 1
Municipal Vulnerability Preparedness (MVP) Program 1
Planning Process 1
Core Team Meeting 3
Preparing for the CRB Workshop 4
CRB Workshop 4
Public Listening Session 5
Other Recent Planning Efforts 6
Hazards and Town Features 6
Identification of Hazards 6
Identification of Town Features 12
Challenges and Concerns Presented by Hazards 16
Current Strengths and Assets 21
Recommendations to Improve Resiliency 22
CRB Workshop Identified Top Priority Actions 23
Conclusions and Next Steps 25

Overview

In 2016 the Massachusetts Municipal Vulnerability Preparedness (MVP) program was created to help communities develop action-oriented plans through a process of researching, prioritizing and addressing climate-related hazards and their local impacts. Somerset received a MVP planning grant in 2019 to work with a MVP Certified Provider to implement the first phase of the program, the planning phase. This Summary of Findings report presents the results of this process, which involved a Core Team planning meeting, workshop material preparation, a full-day, multi-agency Community Resiliency Building planning workshop, and a public listening session. The products of the planning phase are: Summary of Findings Report and Risk Matrices.

About Somerset

Somerset is a coastal town located in Southeast Massachusetts with a population of approximately 18,000. Located in Bristol County, MA, Somerset is located within the Taunton Watershed and adjacent to the Taunton River estuary to the east (7 miles of coastline), Mount Hope Bay to the south, and the Lee River estuary to the west. The southern end of Somerset is on a peninsula. The other town boundaries are with the neighboring communities of Swansea, MA to the west and Dighton, MA to the north. Across the Taunton River to the east is Fall River, MA. [Attachment 1- Town Map]

Somerset is a residential, suburban community between Boston, MA and Providence, RI. There are approximately 7,000 households. The town has several essential facilities, infrastructure for lifeline systems (such as water and electricity), major roads, bridges and a high hazard dam. Social vulnerabilities include persons over the age of 65 years old and 14 facilities for high occupancy or vulnerable populations (such as daycares, schools and elderly housing.)

There are over 800 acres of forest, 50 acres of salt marsh and 100 acres of wetland areas in Somerset. The environmental features of the town include 13 conservation land areas, 9 future development areas, natural water supply from well and reservoir, and one site, the Village, that has been designated as a State Historic District. The natural resources are those included in the Endangered and Priority Habitats on the Massachusetts Natural Heritage and Endangered Species Program. The bordering Taunton River is a federally designated Wild and Scenic River.

Municipal Vulnerability Preparedness (MVP) Program

The MVP program is run through the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA). The goal of the program is to support cities and towns as they build resilience towards climate change through planning and action grants. Planning grants help communities perform a town-wide, multi-hazard vulnerability assessment. Action grants are eligible to communities who complete the assessment and earn status as a MVP Designated Community. Action grants are to help communities implement the actions and priority projects identified in the planning phase and captured in the Summary of Findings Report.

Planning Process

To achieve designation as an MVP community, Somerset applied for and obtained a planning award from the MA EOEEA to conduct a vulnerability assessment following the principles of the MVP approved Community Resilience Building (CRB) process. The CRB process begins with an initial core team planning session to

design and develop a CRB workshop. The goal of the MVP planning process is up to the community to decide. Clearly defining this goal helps to customize the CRB workshop. Somerset had two main goals:

1) To ensure Somerset is resilient and prepared in the face of climate change
2) To further develop the hazards, vulnerabilities, and mitigation strategies identified in the Town's FEMA approved Hazard Mitigation Plan.

A key component to the planning process is stakeholder engagement. Broad involvement is the goal of the MVP program. Stakeholders exist both inside and outside of the community and it is important to provide the opportunity for neighboring communities, businesses, local and regional agencies to be involved in the process. The general public are important stakeholders in the process as well. Listening sessions are held to obtain public comment and interest in the findings of the CRB workshop.

Photo 1. Characterizing Hazards during the MVP Workshop

The MVP planning process is described by steps shown in Figure 1. Selecting a MVP Core Team and holding a Core Team and MVP kickoff meeting is the first step in the process. The Town of Somerset must choose a Certified MVP Provider to facilitate the process but the program is led and established by the Core Team.

Figure 1 CRB Workshop Planning Structure

Core Team Meeting

The Somerset MVP Core Team consisted of a group of town officials from the Fire, Police, Highway, and Water Departments. The MVP Core Team members are:

1) Nancy Durfee, Town Planner and MVP Core Team Leader
2) Scott Jepson, Fire Chief
3) Shauna Geary, Council of Aging Director
4) Richard Brown, Town Administrator
5) Jeff Schoonover, Superintendent of Somerset Public Schools and Somerset Berkley regional School District
6) George McNeil, Somerset Police Chief

7) Bob Bozikowski, Water and Sewer Superintendent
8) Paul Boucher, Building Commissioner and Zoning Enforcement Officer
9) Barry Fontaine, Recreation Department Director
10) Tim Turner, Board of Health and Conservation Commission Agent

A Core Team Meeting was held on August 27, 2019 at the Somerset Public Library. The purpose of the meeting was to establish the CRB workshop goals, to identify stakeholders for the CRB workshop, to exchange and discuss surveys, data and plans, and to go over available dates and logistics for the meetings. At the meeting, goals of the MVP process were discussed as well as available data, potential key stakeholder attendees to the MVP workshop, workshop logistics, location and time for the workshop, as well as a preliminary discussion on issues and vulnerabilities for the Town. The Core-Team meeting agenda and sign-in sheet are included in the Appendices.

Preparing for the CRB Workshop

The CRB Workshop is a multi-hour planning session with a vulnerability assessment. The goal of the workshop is to generate feedback from the attending community members, stakeholders and town officials on the challenges and strengths the town will face by climate-related hazards and identify actions. To prepare for the workshop, local climate data was collected, technical studies and information were reviewed, and hazard risk maps were prepared. The MVP process is not independent of other local and regional planning efforts, so a thorough review of the latest plans, plan updates, studies, and reports was performed prior to the workshop.

In addition to the data collection, workshop materials must be presented. The workshop materials included maps of Somerset with various hazard layers turned on with an overlap of features associated with infrastructure, social or environmental considerations. Workshop assistance materials such as directions for how to fill out the Risk Matrix and example questions to ask during small group discussions were also prepared. Finally a presentation was put together to explain and highlight the climate-impacted hazards data for MA, to facilitate discussion and help walk the group through the exercise of identifying for themselves the hazards that most concern them about Somerset in the near and long term future.

CRB Workshop

The workshop was held on October 15, 2019 at the Somerset Berkley Regional High School. Twenty-three participants attended the workshop. Participants were a mix of Town officials, private business owners or employees, regional organizations such as the Southeastern Regional Planning and Economic Development District (SRPEDD), private citizens, and representatives from state agencies such as Coastal Zone Management (CZM) and MEMA. The framework for the workshop was a one day, evening planning session that involved large group discussions and small group interactive sessions. The results of the workshop vulnerability assessments led by each small group are captured in this report. As a group, priority actions and next steps were planned before the workshop concluded.

Photo 2. MVP Workshop Opening Remarks by the Town Manager

Public Listening Session

A public listening session was held at the Somerset Public Library on December 16th, 2019 from 5:30PM to 7:00PM. A presentation was given by the Town Planner as well as the Water and Sewer Superintendent detailing the process, results, conclusions and action items that resulted from the MVP Planning process. A discussion and Q&A session was held after the presentation. The sign-in sheet is provided in the appendices. The main outcomes and comments that resulted from the public hearing are listed as follows:

- National Grid tree trimming schedule – Regular tree trimming is important because it can prevent damages and power outages from wind. National Grid currently performs tree trimming but it's not well coordinated with the City and it has affected the health of many trees. The Town determined they could be more proactive in coordinating with National Grid when they receive notice so the Tree Warden or another Town official can be present during tree trimming operations.
- UMass Co Op Extension and URI can provide assistance or advice on plantings that are more suitable to prevent erosion. There is potential for collaboration and is a possible outreach opportunity
- Tree planting – the Town had been pro-active in the past by utilizing tree plantings as a measure to control stormwater run-off and is committed to continue to do so.
- Former Montaup Power Plant – It is suspected that asbestos and PCB's may be present at the site based on past uses and should be evaluated.
- Main Street – Within the last 5 years flooding has been observed over the earthen piers and that was not the case in past times.

Other Recent Planning Efforts

Somerset's recent planning efforts were reviewed and incorporated into the planning process. Somerset participates with regional planning committees on a regular basis such as SRPEDD. Regional planning effort documents that were reviewed and incorporated into the planning process are listed below:

- Assessment of Land Use Activities and Non-point Source Pollution for the Taunton River Watershed, December 2004 by Southeastern Regional Planning and Economic Development District
- Taunton River Watershed Pilot Project, 2010-2011, "GRRIP 6" Integrating Biodiversity and Infrastructure Considerations to Prioritize Transportation Projects, January 2012 by Southeastern Regional Planning and Economic Development District
- MassDEP Water Utility Resilience Program, October 20, 2017 by Southeastern Regional Planning and Economic Development District
- Town of Somerset Zoning By-Law, Amended March 2018
- Town of Somerset Natural Hazard Mitigation Plan by GZA GeoEnvironmental, Inc. November 7, 2018
- Hydrologic and Hydraulic Analysis of the Somerset Reservoir Dam, 2018
- Town of Somerset, MA Master Plan, Drafted June 2019
- Stormwater Management Program (SWMP) (Volumes 1-4), Volume 1 Stormwater Management Plan June 2019 by BETA Inc.
- Comprehensive Stormwater Management Plan, August 2019
- Hydraulic Design Report of the Somerset Reservoir Dam, December 2019
- Integrated Water Resource Management Plan, December 2019
- Comprehensive Wastewater Management Plan, December 2019
- Drinking Water Management Plan, December 2019

Hazards and Town Features

The CRB process provides the framework for the community to identify through discussion, and backed by data, maps and local history, the hazards faced in the past, present and future. This hazard assessment is carried out by visiting the MVP Resilient MA Climate Change Clearinghouse for the Commonwealth to collect local hazard data and documents and to find the latest research and studies related to climate change in Massachusetts. The types of hazard to impact Somerset are not only climate-related hazards, but climate impacts may worsen a natural hazard over time. Past and current identified hazards are reviewed in association with clearinghouse data to review trends. From this a future hazard risk can be projected.

Identification of Hazards

Hazard identification begins with a review of the town's history of events.

Past Hazard Risk

The Natural Hazard Risk Assessment completed as part of Hazard Mitigation Plan includes a cataloging of the types and severity of known hazard events that are a part of Somerset's long history. Hurricane and Winter Storm events had the greatest impact in regards to damage costs and requests for Federal Assistance.

A sample of the history of hurricanes, Nor'easters and coastal flood events to hit Massachusetts are:

- 1938 Hurricane- largest coastal flood event on record for the Town of Somerset
- Hurricane Carol (1954)
- Hurricane Gloria (1985)
- Hurricane Bob (1991)
- 1991 the "Perfect Storm"
- Nor'easter of 1963
- Nor'easter of 1974
- Nor'easter of 1978
- Nor'easter of 1987
- April Nor'easter of 2007
- March Nor'easter of 2010 with 16 inches of rain
- Tropical Storm Irene (2011)
- Superstorm Sandy (2012)

Current Hazard Risk

High frequency events in Somerset are severe wind, thunderstorms, lightening, hail, and snowfall. These events have a recurrence interval of 1-2 years and can range in severity. Medium frequency events are those that have a 10- to 2-percent chance (10- to 50-year recurrence interval (RI)). These include intense rainfall, coastal flooding, urban flooding, excessive heat, and drought. It is well known that FEMA's base flood in flood insurance mapping is the 1-percent annual chance flood events (a.k.a the 100-year RI flood) and do not include impacts of sea level rise, which can exacerbate the risks. However, these events can occur in any given year and can occur multiple times in a year and just not once every 100 years. All storm events are becoming more frequent and it is not unlikely to see coastal flood impacts reaching levels of a 0.2-percent annual chance events (a.k.a. 500-year flood) or higher on hazard maps. These frequency notes are meant only to be a guide as to how impactful events may be.

Some current hazards are believed to be worse than past hazards in frequency, intensity and because of manmade infrastructure degradation. Some examples of this include the Reservoir Dam which, as a manmade hazard, has always presented a significant risk to the community if a dam breach or catastrophic failure were to occur. However, over the life cycle of the dam, the risk grows greater as manmade systems can deteriorate over time and the effects of climate change applies unforeseen stress on this structure.

Future Hazard Risk

The MVP program asks communities to consider future hazard impacts while planning in the present. Forecasts and projections of temperature, sea level rise, precipitation and other hazards are collected and distributed to all participants through the MVP Clearinghouse. Examples of this data are:

- Increase in precipitation amounts, intensity, and frequency

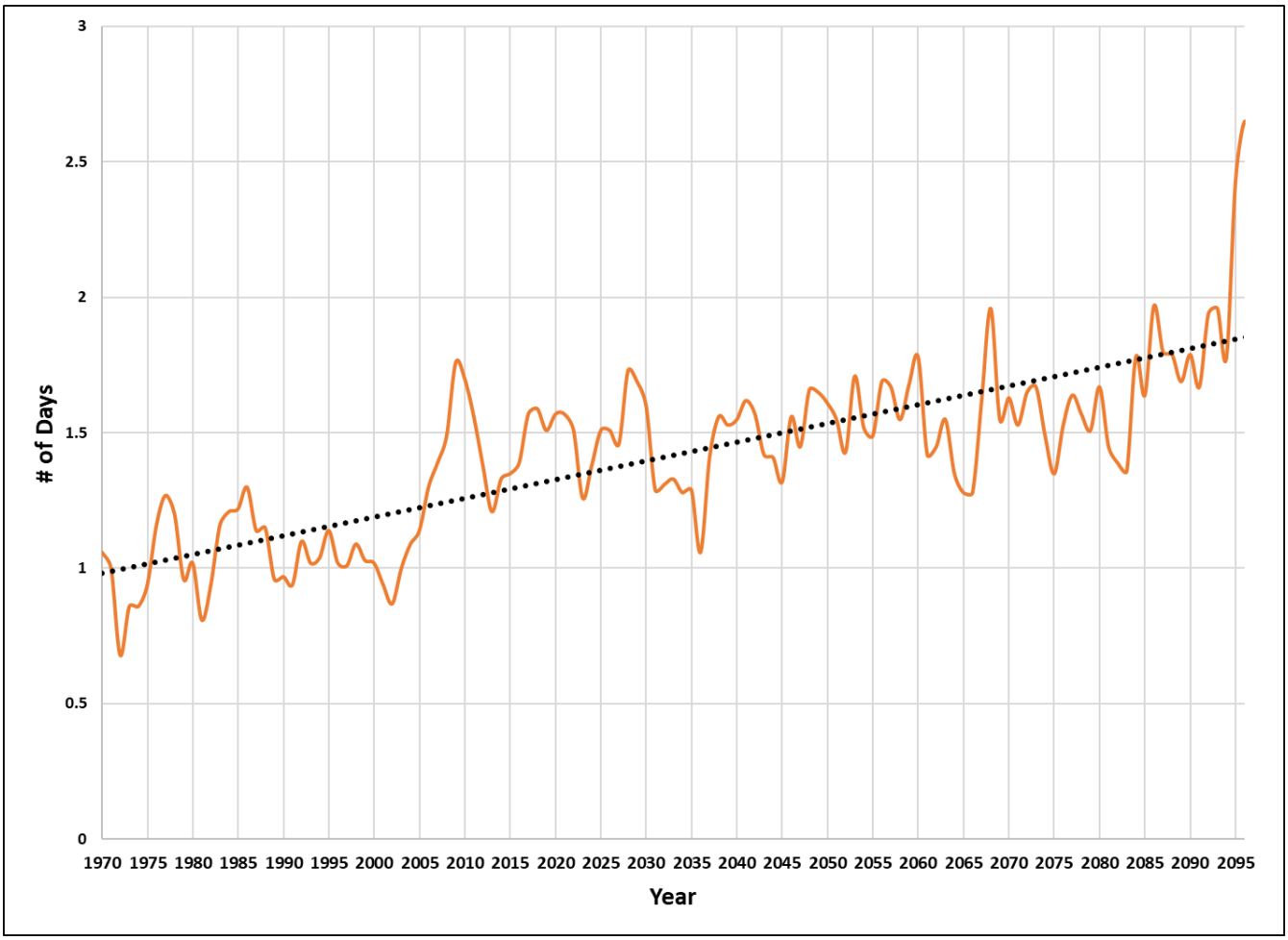


Figure 2. Increase in number of days in a year with more than 2 inches of rain

- Increase in annual average temperature

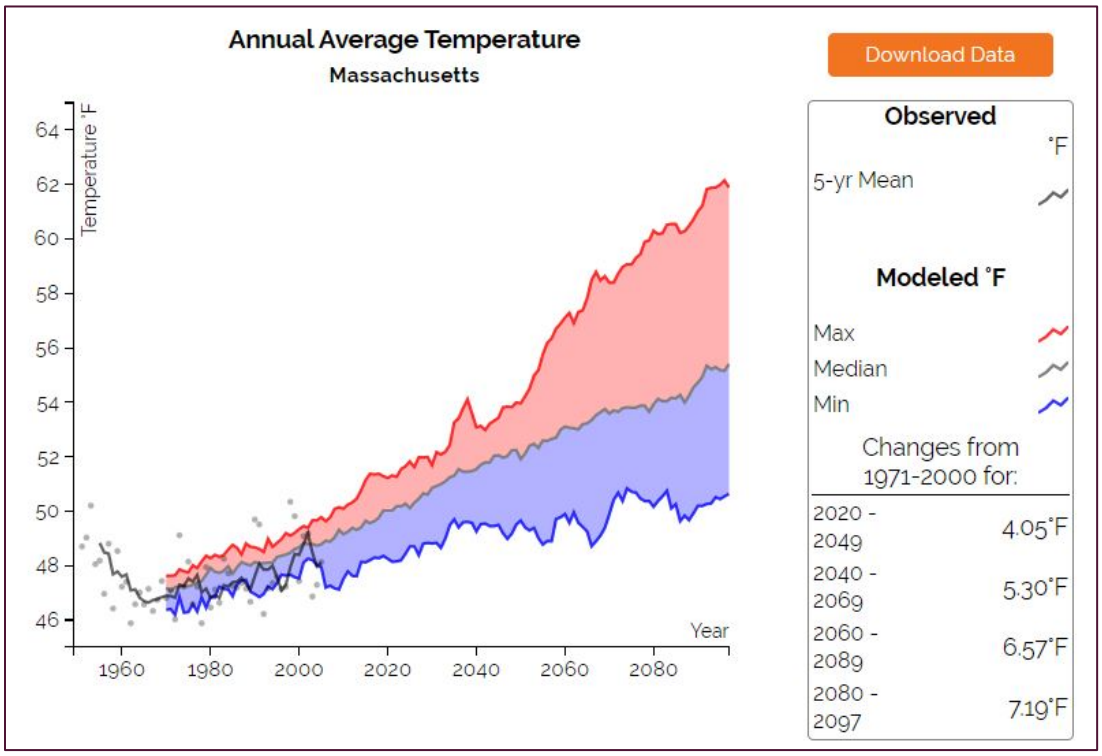


Figure 3. Projected increase in annual average temperature

- Increase in number of very hot days in a given year

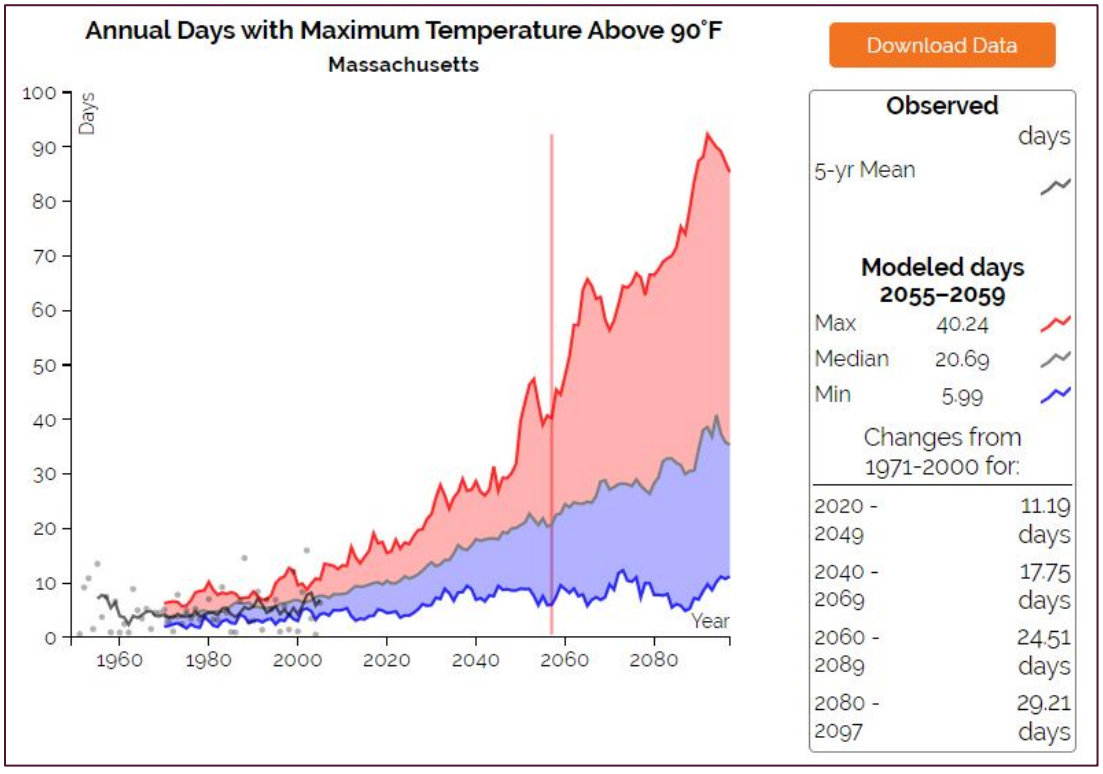


Figure 4. Projected increase in annual days with maximum temperature above 90 degrees

- Higher ocean levels due to sea level rise and storm surge

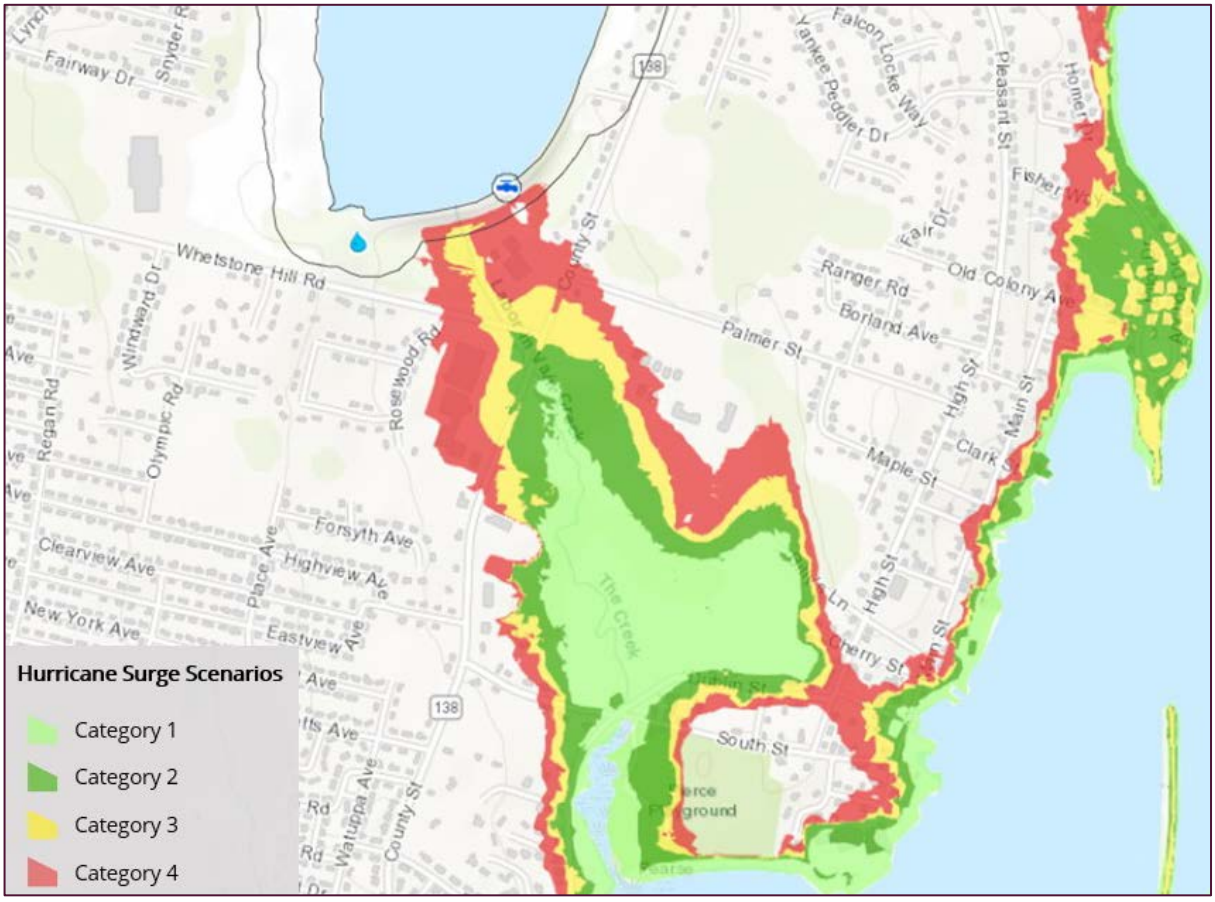


Figure 5. Hurricane surge projected impacts (source: MA Office of Coastal Zone Management)

MVP Participants Identified Hazards

Participants of the CRB workshop discussed and identified a list of hazards for Somerset. The full list is shown in the appendices. The top priority hazards identified by stakeholders at the CRB workshop were:

1) Hurricanes
2) Nor'easters
3) Flooding (surge) / Flooding (inland)
4) Rain events

<u>Hurricane</u>

Hurricanes encompass a number of threats. A named Hurricane or Tropical Storm event may cause severe wind, coastal surge, heavy precipitation, and wind-driven rain. This can result in wind damage, debris, coastal flooding, inland flooding, and water infiltrating into pipes and homes.

Nor'easter

Nor'easters also contain numerous threats. Nor'easters may cause severe rainfall or blizzard type conditions with heavy snow, ice, and severe wind. Nor'easters can also cause storm surge and coastal flooding. Damage from severe wind or severe snow loading can cause wind-driven debris, downed trees and power lines, collapsed roofs, and hazardous travel conditions.

Flooding (Surge)

Coastal storm surge includes flood inundation and wave action. Wave run-up is included in the base flood elevation in the FEMA 1-percent chance annual flood model on the coast. Storm impacts may raise the water level (called the stillwater elevation), create waves (wave height) and push the water inland (wave run-up). Nuisance flooding, which is a shallow flooding, can occur along the coast due to changes in the tides such as a naturally occurring high tide.

Flooding (Inland)

Inland flooding is caused by rainfall events. This can be either urban flooding, flooding associated with stormwater management, or riverine flooding. There are no rivers in Somerset so riverine flooding is not an issue. Urban flooding has been chronic in locations in town however and this does occur during large rainfall events.

Heavy precipitation rain events

Rainfall that falls quickly and heavily can result in flash flooding and intense local flooding. These events are also known as cloud bursts and tend to occur in the summer months. Improperly sized stormwater infrastructure such as catch basin inlets, culverts, and pipes can contribute to and exacerbate the effects of heavy precipitation floods. Additionally the Somerset Reservoir may not be able to accept the volume and flow rate of water this type of event adds to the watershed and will have to divert storm water to drain around the Reservoir.

Top hazards selected by each team for use in the small group session Risk Matrices were:

Yellow Team	**Blue Team**
Coastal flooding, storm surge	Dam Breach
Inland flooding	Nor'easter, Hurricane
Wind/Hurricane	Rain Events, Bursts, Continuous
Ice/Snow/Blizzard	
Green Team	**Red Team**
Floods	Rain event
Hurricane	Hurricane surge/flooding
Nor'Easter	Nor'easter (snow and ice)
Extreme Temperatures	Wind

The group also discussed man-made hazards, which primarily included discussion of the high-hazard Somerset Reservoir Dam. The focus of the hazard identification process in the workshop was to incorporate climate data and projections into that hazard impact analysis. The existence of the dam is a man-made hazard because failure of the structure of the dam could be catastrophic. However the dam is also impacted by changes to climate-related hazards because the design capacity of the dam is was set during the original design process.

Additional capacity would most likely require strengthening of the existing dam walls and addition of a spillway and other features not currently part of the dam.

Identification of Town Features

Hazards are threats. Each individual asset in a town, a facility, infrastructure system or program, can be a strength or a weakness in the face of the hazard. Community strengths and vulnerabilities are defined by first identifying town features that are either critical, important, at-risk, resilient, or target areas for any member of the community. There are three categories that features are grouped under for the CRB Risk Matrix:

- **Infrastructure**- Manmade features- structures and facilities- that are related to critical lifelines, transportation, public health, etc. which contribute to the successful operation of a society.
- **Social**- Features related to the continuity of operations of facilities that support social services. Social infrastructure includes healthcare, education, public facilities and transportation services.
- **Environment**- Natural, preserved and/or manmade features associated with safeguarding the environment and protecting human health. These may be related to the engineering or maintenance of systems which provide safe water supply, waste disposal, pollution control, fish and wildlife protection and recreation.

During the CRB Workshop, the participants were asked to identify features of Somerset through large group discussion and on the risk matrices in the smaller groups. The documented and most widely discussed features of the community under each category are detailed in the tables below with a brief description.

Table 1. Infrastructure Features Identified by Stakeholders

Features- Infrastructural	Description
Somerset Reservoir Dam	The Somerset Reservoir Dam is located on the Labor-in-Vain Brook. The impounded water from the earthen dam forms the Somerset Reservoir and is the primary supply of drinking water for the Town. The facility is owned and operated by the town. It can hold up to 1.4 billion gallons of water and has a watershed of 1.8 square miles. In 2016 an inspection report and an Emergency Action Plan were developed. Due to its large size, the dam is classified by the MA Dept. of Conservation and Recreation (DCR) as a Class I (High) hazard potential structure.
Wastewater- Sewer Treatment Facility	Somerset Water Pollution Control Facility. The Town is entirely on public sewers. Increased storm water inflow and infiltration burdens the treatment facility.
Wastewater- Storm water Conveyance	Town of Somerset's Storm Sewer pipes, catch basins, manholes, culverts, swales and outfalls discharging to wetlands, streams, lakes, ponds and rivers. Approximately, there are a total of 2,460 catch basins, 404 curb inlets, 155 outfalls, and 784 storm drain manholes.
Wastewater- Pump Stations	Somerset sewer system has a total of 17 pump stations. Most of these are located in low-lying sections of town along the shoreline. There are15 pump stations within projected flood boundaries.
Water Supply- Water Treatment Facility, Pump House	Town drinking water comes from the reservoir and a community groundwater well. Water treatment plant processes approximately 1 billion gallons/year. Inter-municipal connections with Dighton, Swansea, and Fall River provide backup supply of drinking water.
Roadways	Somerset Highway Department maintains the 86 miles of town-owned roads. The Massachusetts Department of Transportation (MassDOT) has several roads within Somerset including Route 138, Grand Army of the Republic Highway (Route 6) and I-195. There are 16 miles of state-owned roads.
Culverts	Culverts move water beneath roadways. Many culverts, and streets, are at low elevations. Culverts may not have the necessary capacity to convey storm water depending on when these culverts were designed. Additionally culverts can get plugged with debris, can have erosion around the inlet or outlet, or can be misaligned. Within the town there are 39 culverts and some of these are maintained by MassDOT. Along the shoreline, there are also many outfalls and outlets.
Electric Distribution System	The electric distribution system has many overhead wires that are at risk of being damaged during hazardous conditions, especially during events with high winds or ice storms that could bring down power for extended periods of time.
Public Safety Complex	The Fire Department Station Headquarters and the Police Department Headquarters are located together at 475 and 465 County Street, respectively. The station and police headquarters building were built in 1964-65 and both are in good condition. The complex, which also houses an EOC and 911 dispatch, is located central within the town and is not in a floodplain.
Coastal Structures	A Coastal Infrastructure Inventory and Assessment Report Update was published in 2014. This 2014 Update includes 13 structures, including 6 bulkhead/seawalls, 6 revetments, and a coastal beach.

Table 2. Societal Features Identified by Stakeholders

Features- Societal	Description
Housing Authority	The Somerset Housing Authority is responsible for providing and administering Public Housing for Senior Citizens, age 60 years of age or older and handicapped Citizens of limited income or on disability. The Housing Authority maintains two complexes located on Read St: John F. Kennedy Terrace and Eugene Murphy Village.
Elderly Housing	Approximately 30% of the population is over the age of 60. There is a Somerset Council on Aging (COA), which provides services to seniors. Some seniors reside at home while others are residents of the three senior facilities in town, the Clifton Assisted Living Community, Clifton Rehabilitation Nursing Center, and the Somerset Ridge Center.
Shelters	The town Emergency Shelter is located at the Somerset Berkley Regional High School.
Vulnerable Neighborhoods and Populations	This may include citizens with language barriers or traditionally labeled 'high risk' populations such as the elderly.
Schools	Somerset has five public schools in town- Chace Street School, North Elementary, South Elementary, Somerset Middle School, and the Somerset Berkley Regional High School. Approximately 3,000 student age youth reside in Somerset. The schools employ roughly 450 daily workers.
Public Safety Communication	Currently, not all Public Safety entities within the Town use the same communications system, which may make it challenging to coordinate efficiently during emergencies. Additionally the Town has a large percentage of elderly residents and non-native English speakers that may be hard to reach via normal communications channels in case of an emergency.
Municipal Organization	The organization of the town municipal government includes a Town Administrator, Town Planner, Board of Health, Building Commissioner, Conservation Agent, Town Accountant, Town Assessor, Town Clerk, Treasurer, Tree Warden, Veterans Director, Tax Collector, Recreation, Harbor Master and all of the town Departments housed outside of Town Hall. Town Hall is located at 140 Wood Street.
Planning and Zoning	Planning and Zoning participates in regulatory floodplain map updates and revisions. Recent statewide and regional studies have identified critical habitat and natural zones within town which Planning and Zoning are incorporating into the Town Master Plan and other current planning efforts.

Table 3. Environmental Features Identified by Stakeholders

Features- Environmental	Description
Brayton Point Industrial Redevelopment Area	Brayton Point used to be the site of a power plant. It contains 365 acres adjacent to freshwater wetlands, salt marshes and a coastal barrier beach. The site is undergoing planning for economic development.
Beaches and Dunes- Brayton Point Beach	Brayton Point Beach is a 0.5 acre recreational area with picnic space, a waterfront vista and a rocky beach.
Beaches and Dunes- Pierce Beach (Big Red Slide)	Pierce Beach Park and Recreation Area is made up of a beach area with picnic tables and grills, a bandstand and a bathhouse, two playgrounds, playing fields and courts. There is an iconic "Big Red Slide" that was built in 1988.
Salt Marshes	Somerset has 50 acres of salt marsh. These marshes are featured in the identified Coastal Adaptation Areas (BioMap2 Program) in Somerset which preserves undeveloped land around the marsh to allow for sea level rise and climate impacts extending the salt marshes inland over time.
Wetlands	Somerset has 100 acres of inland wetland areas. Wetlands and other flood prone open space improve coastal resiliency and flood retention, and promote biodiversity and natural landscapes.
Somerset Marinas	Somerset Boat Ramp (Waterfront Park), Bristol Marine, Somerset Marina and Yacht Sales, Gladding-Hearn Shipbuilding, Fortier Boats,
Topography	The southern portion of Somerset is on a peninsula with low lying shoreline on three sides. However, most of town is at an elevation much higher than the 100-year base flood elevation as the land quickly rises in elevation from the shore. The highest town elevation is approximately 180 feet above sea level. The vulnerable sections of town for storm surge or coastal flood inundation are shoreline areas.

Challenges and Concerns Presented by Hazards

Somerset has vulnerability to a number of natural and man-made hazards. These hazards include flooding, sea-level rise, storm surge, snow and ice, wind, and increased precipitation. The town features and areas of concern for climate impacts were evaluated through a small group vulnerability assessment process in the CRB workshop. The top results follow. These results summarize the challenges.

Somerset Reservoir Dam/ Water Treatment Facility/ Labor-in-Vain Brook Culverts

A recently completed H&H study (PARE/2018) of the Somerset Reservoir dam show that, under existing conditions during a ½ Probable Maximum Flood (PMF) storm event, the area around the reservoir will flood and properties will become inundated. The dam is overtopping in this scenario and will breach. Furthermore, erosion on the front face of the earthen dam could undermine the toe and lead to structural instability. Mitigation for the current ½ PMF storm flooding scenario has been hydraulically studied and mitigation measures were proposed as part of the study.

At the southern end of the dam is the Somerset Water Department Water Treatment plant. Normally when storm water leaves the dam it is channeled around the treatment facility and joins up with the labor-in-Vain Brook. The Brook passes under Whetstone Hill Road and County Street (Rt 138) through pipe culverts and then discharges into the marsh. Studies of the culvert crossings at these two roadways have found the crossings to be inadequate. The culverts are presently undersized. Due to the dam, storm event flood conditions on the Labor-in-Vain Brook are dampened. During a ½ PMF storm event study, flood inundation is projected to occur at the Water Treatment plant from the north end of the dam discharge. This would channel into the Labor-in-Vain Brook and cause local flooding at the street crossing that cannot handle the additional capacity. Backed up flow would overtop the streets once they reach the elevation of the roads. Flooding across roads not only causes damage, but interrupts traffic flow and emergency egress.

In a scenario where the Water Treatment Facility is flooded, the potable drinking water for the town is at risk. A pump station is located at the treatment facility. If the pumps that serve the potable water supply stop functioning due to flooding, there is a reduced capacity to move and deliver water. If the treatment facility cannot prepare the water supply for public consumption, due to inundation, mechanical failure, or other, then the potable water service would be impacted.

The treatment facility is also subject to hazards that could interrupt power to the facility such as severe wind causing damage to the electrical power grid. The Water Treatment plant does have a generator backup power which reduces this risk.

The dam itself, as any dam structure is, is a hazard in the town. The large reservoir is supported by an earthen structure. The structural integrity of the facility must always be evaluated and maintained. Recent inspections were performed in 2018. If there were a breach or failure of the dam, then the release of the impounded water would have catastrophic impacts downstream. The reservoir levels are monitored and controlled, the rules and regulations governing the operation of a high-hazard facility by the state's Department of Conservation and Recreation (DCR) are followed by the town, and emergency action plans are in place, however the dam will remain a high-hazard facility. With climate impacts increasing storm precipitation volumes and frequency, the management and control of water into and around the dam to not overload the dam will remain a challenge. Additionally, drought and more days of warmer temperatures could reduce levels in the dam which may expose more of the structure to natural elements and erosion. Climate-related impacts could alter the hazard rating of the dam.

Somerset Developed Shorelines/Coastal Structures/ Low Lying Facilities

There are two effective FEMA Flood Zones which are mapped in the Somerset Flood Insurance Rate Map (FIRM). These are Zone A/AE- 1-Percent Annual Chance Flood and Zone VE- 1-Percent Annual Chance with Velocity Hazard (i.e. Wave Action). Due to the topography of Somerset, most of the 1-percent annual chance floodplain is also in the VE zone meaning the limits of the 1-percent annual chance floodplain are very close to the shore. Hurricane maps show that storm surge can inundate the entire coastline of Somerset. Surge is a push of water onto land so is dependent on many factors including, river and bay elevations, wind direction, slope of the shoreline, shoreline type (i.e. vegetated, buildings, structures) and other factors. Due to topography the hurricane surge areas mirror the AE and VE Zones. Additionally, the NOAA 10-foot sea level rise data follows the same flood boundary as today's 1-percent annual chance flood. Acting independently of one another, these hazards all impact the same low-lying coastal areas for all of the town boundaries with the Taunton River, Lee River and Mount Hope Bay. If combined together, in the future for instance when sea level raises the water surface elevation, the surge inundation area and the 1-percent annual chance floodplain area will grow larger.

Under today's conditions, the coastal structures, facilities, natural features, businesses and homes within the 1-percent annual chance floodplain are at risk from coastal flood events (i.e. heavy precipitation, extreme tidal conditions) and storm surge flood events. Coastal development is also subject to severe wind.

The Sewer Treatment Plant is located in the 1-percent annual chance floodplain. Part of the facility is in the VE Zone (area of >3ft waves). Wave velocity can cause structural damage to the Treatment Plant facility. Flood inundation may impact the holding tanks, pumps, controls, and operation facilities which in turn can impact treatment. Damages which cause long term repairs will force the utility to function at a reduced capacity and treatment efficiency. Additionally, increased storm water inflow into the sewer mains can cause operational impacts due to the flow volume impact to the biological process. When the system is overloaded by storm water inflow, the treatment processes are negatively affected. The Sewer Treatment Plant is vulnerable to hazard threats that impact any component of the sewer collection system. Fortunately, there is backup emergency power at the plant to provide resilience to power disruptions.

Fifteen out of the seventeen sewer system pump stations are located in the 1-percent annual chance floodplain. Most of these pump stations have emergency backup power. Three stations without generators are wired to accept a portable generator. Flood inundation and wave action can damage the facility, the pumps and the system controls. If a pump station loses the capacity to function, then the transport of wastewater stops. The pump stations (PS) impacted by flooding and surge hazards are, the Sewer Treatment Plant, Foley PS, Grove PS, Dublin PS, Main Street PS, Lee River PS, Pilot PS, Pleasant PS, Route 6 PS, Angus PS, Wilber Ave PS, Lake St PS, Owen PS, Durfee PS, Gay St PS and Cherry St PS. The Town is finalizing an Integrated Water Resource Management Plan. This Plan assesses and ranks pump stations based on their overall condition and susceptibility to hurricanes and sea level rise.

In addition to the sewer utility having most of its critical infrastructure in the low-lying parts of town, there are coastal structures, homes, businesses and recreation facilities. In 2014 a MA Coastal Infrastructure Inventory and Assessment Report Update was prepared. There are 6 bulkheads and seawalls in town and 6 revetments. These were placed to protect the shoreline. Flooding and wave action can erode the existing shore and sea level rise will cover sections with water. The seawall at the Somerset Waterfront Park is in

dire need of repair. The work has been engineered and permitted but no funds are available at the moment to execute the work.

There are marinas and industrial businesses along the coast which support marine transportation and recreation, such as ship building and marine services. The marinas and boat launches provide economic and recreational benefits to the town. Being at the water's edge, marinas can be subjected to some of the highest intensities of coastal hazards such as severe wind, wave action, surge, and flooding. These facilities can suffer structural damage, slip damage, and flood damage. As a business, they can lose revenue while making repairs.

Somerset Natural (Undeveloped) Shorelines/ Conservation Land/ Beaches

Somerset's location on a peninsula in the Mt Hope Bay provides a rich, tidal ecosystem along all of its shores. The Massachusetts Natural Heritage and Endangered Species Program (NHESP) and The Nature Conservancy's Massachusetts Program created a state conservation program called BioMap2. Through this program areas were mapped and identified as Core Habitats in and adjacent to Somerset. Additionally, there are areas of Priority Habitats of Rare Species that the NHESP registers on the MA Natural Heritage Atlas adjacent to Somerset. Many of the beaches, marshes and wetland areas in Somerset are considered Critical Natural Landscapes and Coastal Adaptation Areas. Preserving these areas maintains a natural defense and resilience to severe storm event impacts. These undeveloped lands are also flood retention areas for flood surge and heavy precipitation events.

The town of Somerset's storm sewer system is made up of pipes, catch basins, manholes, culverts, swales and outfalls. This system primarily discharges to wetlands, streams, lakes, ponds, rivers, and Core Habitats. Flooding events can cause debris to travel and discharge with storm water. Increased discharges may scour and undermine outfalls. Coastal hazards such as storm surge and wave action can change shorelines erode pipes, swales and outfalls.

Two beaches were included in the identified town features, though there are more beach areas along the shoreline. The two beaches are town parks: Brayton Point Beach and Pierce Beach. Pierce Beach has a landmark "Big Red Slide" in the playground. As parks, these features are listed for one primary reason, they are highly valued and significant to the character of the town. In the 2005 Taunton River Landscape Inventory Somerset Reconnaissance Report, these types of features are called Heritage Landscapes. The loss or degradation of the beach parks due to erosion, sea level rise or pollution from increased storm events would impact the public's use and enjoyment of valued resources.

Roads/ Storm Water Management/ Culverts

A topic raised before, during and after the CRB workshop, in regards to transportation infrastructure, is the coordination and collaboration needed between the Somerset highway department, Somerset Town officials, and the state, MassDOT, for a town-wide strategy to build resilience in the road network. This is in regard to both road systems and storm water management. For state-owned roads, the culverts beneath the roads are also owned by the state. A great coordination effort is needed to make improvements to undersized culverts.

Storm water is managed through an underground system of pipes to collect runoff from roads through catch basins and curb inlets. Culverts move storm water and natural drainage past roadways and other surface interruptions. There are thousands of components of the storm water management system that need to be

maintained by the Highway Department and many of them, such as outfalls, culverts and swales, which are more susceptible to erosion and damage from hazard impacts.

A comprehensive stormwater management plan was completed in 2019. This plan assessed infrastructure and identified nearly ten million dollars in project needs.

Somerset Highway Department maintains the 86 miles of roads. In the 1-percen annual chance floodplain there are low lying streets, storm water drains and culverts. These could be inundated by flood water. Debris can get caught in storm water management systems and damage or block culvert inlets, outlets and catch basins. During winter storms, snow and ice removal from town-owned roads is the responsibility of the Highway Department. Sand added to icy road systems can fill storm water pipes and basins.

The 1-percent annual chance flood impacts several sections of low elevation roads and culverts in town. The causeways on Route 103 and Route 6 (Grand Army Highway) are at elevations below the Base Flood Elevation (BFE) of the 1-percent annual chance flood event and, therefore, sections of the road would be completely inundated. The culvert under Route 6 (Route 6 Culvert) is at a low enough elevation that a 10-percent flood event would compromise it. Culverts that are submerged can cause localized storm water flooding upstream. In some locations in town, culvert outfalls are submerged during tidal events, such as the Riverside Avenue culvert at Buffington Brook. The frequent disruption of flow, as well as the impacts of water on the structure surrounding the outfall itself, can cause erosion and failure quickly.

Communication Systems

Public Safety communication is currently a challenge because not all of the town's public safety departments are connected by the First Net system. This is a vulnerability across all hazards because of the criticality of communication. The Police Chief expressed concern because their internal communications system loses signal during very heavy rainfall events, which in itself is concerning because many climate-related emergencies involve heavy downpours.

Vulnerable populations

The Somerset Council on Aging plans for the wellbeing of senior residents of the town. A current challenge is transportation shuttle needs. In an emergency, transportation assistance would be a top priority.

There are residents who do not speak English as their native language. A challenge for the town is to have a better understanding of where these residents live, what their needs are and what their risk level is.

Schools/Shelters

The town Emergency Shelter is located at the Somerset Berkley Regional High School which is centrally located and not in a floodplain. The facility is newly constructed. There is backup emergency power at the high school but some deficiencies have been identified such as the bathrooms were not hooked up to the generator and not operational when running with emergency power as it's all automated. The school has not yet been exercised as a shelter.

Brayton Point/ Redevelopment/ Zoning

Brayton Point is a 365-acre site adjacent to freshwater wetlands, salt marshes and a coastal barrier beach. The site is going to be redeveloped. A portion of the site is located in the 1-percent annual chance floodplain and is subject to inundation during hurricane events.

The challenges and concerns raised in the CRB workshop are summarized by hazard risk in the Vulnerable Assets tables.

Table 4. Infrastructure Vulnerabilities

Infrastructural	Vulnerabilities
Somerset Reservoir Dam	Flooding (heavy precipitation) – Could cause local flooding from dam erosion, structural instability of the dam. Primary supply of drinking water
Wastewater- Sewer Treatment Facility	Flooding (1-percent annual chance floodplain), Flooding (surge), Flooding (heavy precipitation) – Could cause reduced function or loss of function of wastewater utility, components and pump damage, erosion, release of sewage
Wastewater- Storm Water Conveyance	Winter Storms, Flooding (1-percent annual chance floodplain), Flooding (surge), Flooding (heavy precipitation) – Could cause increased inflow into sewer system, erosion, blocked inlets, local flooding and ice buildup
Wastewater- Pump Stations	Flooding (1-percent annual chance floodplain), Flooding (surge), Flooding (heavy precipitation), tidal increases, sea level rise – Could cause erosion or component or pump damage, reduced or loss of function could occur causing release of sewage.
Water Supply- Water Treatment Facility, Pump House	Flooding (heavy precipitation event, dam release), Hurricane (Severe Wind) – Could cause reduced function or loss of function of potable water utility, components and pump damage, erosion
Roadways	Winter Storms, Flooding (1-percent annual chance floodplain), Flooding (surge), Flooding (heavy precipitation), Local flooding from inadequate storm water management capacity – Could cause erosion, structural damage, blocked roadways, and disruption to transportation
Culverts	Winter Storms, Flooding (1-percent annual chance floodplain), Flooding (surge), Flooding (heavy precipitation), Tidal increases, Sea level rise – Could cause erosion, structural damage, clogged culverts or outfalls, local flooding and ice buildup.
Electric Distribution System	Hurricane (Severe Wind), Nor'easter (Severe Wind)- Could cause power outages, damage to infrastructure
Public Safety Complex	Hurricane (Severe Wind), Nor'easter (Severe Wind and heavy snow)- Could cause power outage, debris that blocks or restricts emergency access
Coastal Structures	Flooding (1-percent annual chance floodplain), Flooding (surge and wave action), Tidal increases, Sea-level rise – Could cause structural damage and erosion

Table 5. Social Vulnerabilities

Social	Vulnerabilities
Public Housing Authority, Elderly Housing, Vulnerable Populations	Hurricane (Severe Wind), Nor'easter (Severe Wind and heavy snow), Flooding (1-percent annual chance floodplain), Thunderstorms or Bursts, Heavy Precipitation, Extreme temperatures – Could cause power outages, restricted access, need for cooling, heat or sheltering
Shelters, Schools	All hazards – Could cause emergency management needs for a large population
Public Safety Communication, Emergency Backup Power	All hazards – Could cause emergency management special needs to overcome communication or power failures

Table 6. Environmental Vulnerabilities

Environmental	Vulnerabilities
Brayton Point Industrial Redevelopment Area	All hazards including sea level rise and tidal increases – Could cause erosion, shoreline changes, and depending on what the development is and how it is regulated, new facilities may be subject to wind or flooding damage
Beaches and Dunes	All hazards including sea level rise and tidal increases – Could cause erosion, shoreline changes, heritage resource impacts
Salt Marshes	All hazards including sea level rise and tidal increases – Could cause erosion, ecological impacts, loss of coastal protection for properties behind the marshes, marsh migration
Wetlands	All hazards including sea level rise and tidal increases – Could cause erosion, ecological impacts, loss of coastal protection for properties behind the wetlands, wetland migration
Somerset Marina	All hazards including sea level rise and tidal increases – Could cause erosion, shoreline changes, economic impacts

Current Strengths and Assets

Town features which are strengths for climate resilience were also identified and discussed in the CRB Workshop. Strengths may be planning actions, organization and communication of town stakeholders, redundancy, hazard mitigation and the preservation of natural defenses against severe weather events. The identified strengths are as follows:

- Somerset has an approved hazard mitigation plan and is participating in programs such as MVP to regularly update and inform the plan. Mitigation strategies are identified in both plans which provide actionable, risk reduction techniques to strengthen vulnerabilities.
- Somerset participates in the National Flood Insurance Program which allows insured property owners to receive assistance after a flood event.
- The Public Safety complex combines the Police and Fire Departments in one geographic location which unifies emergency response operations and promotes collaboration.
- Somerset's higher elevations above sea level and lack of rivers provides a less complex flood risk assessment of which high-probability flood hazard areas can be identified for mitigation and response.

- Somerset has a 2018 Somerset Reservoir Dam Emergency Action Plan which contains response and communication procedures for Dam emergencies.
- Somerset is completing an Integrated Water Resource Management Plan that assesses drinking water, wastewater, and stormwater infrastructure.
- Proactive tree trimming practices are in place by National Grid and the Town's Tree Warden to reduce the loss of electricity due to downed tree limbs as a result of natural hazards.
- Zoning practices in Somerset have incorporated floodplains, wetland areas, marshes and critical habitat environments into zoned floodplains or conservation land which protects natural defenses against flooding and other severe weather events.
- The Sewer Treatment Plant and the Water Treatment Plant have backup generator power for continuity of operation when severe weather events impact the power system.
- Somerset's emergency shelter is located in the high school which is a newly constructed building on high ground in the center of town.

Recommendations to Improve Resiliency

In the small group sessions, workshop participants were tasked with identifying mitigation strategies that would reduce or avoid the feature's vulnerabilities to hazards. Each group chose four hazards to be their top priority hazards and then they strategized on how vulnerabilities could be addressed. Immediate and long-term vulnerabilities were assessed with developed strategies recorded in the Risk Matrix.

To improve resiliency in Somerset to long-term climate impacts, the participants of the CRB Workshop decided that further studies and risk and vulnerability assessments were needed. Somerset does not have many system wide and local studies of the critical infrastructure, transportation and storm water management systems. To catalogue, map, and evaluate the systems for detailed hazard risk and vulnerabilities was a top action.

Another group-wide strategy was to focus on the high-hazard dam to make sure that the resiliency of the dam was being addressed. Studies were recently completed showing the local flood risk to properties around the dam, including the water treatment facility and potential loss of the Town's drinking supply. To improve resiliency, the group as a whole strategized to continue the next phase of the engineering analysis of the dam and to implement improvement as soon as possible.

Mitigation actions also included hardening the pump stations, water and sewer treatment facilities, and coastal infrastructure to withstand coastal and inland flooding, to coordinate with state agencies on undersized road culverts and low elevation corridors, to improve emergency management operations with better communication and redundant power, and to bolster zoning and development planning to include more smart development and green infrastructure.

CRB Workshop Identified Top Priority Actions

All of the small group Resiliency Actions (top 4-5) were posted during the workshop and participants were asked to independently vote on which strategies they believed should be included in Top Priority Action list. The results are presented in the table.

Table 7. Top Priority Actions Identified in the CRB Workshop

	Feature	Resiliency Action	Number of Votes	Priority Level	Timeline
#1	Reservoir Dam	Implement Proposed Improvements, Maintain dam to reduce risks	19	High	Start 2020
	Reservoir Dam	Complete an Alternatives Analysis for flooding and dam failure hazards and alternatives for addressing insufficient culvert capacity issues on the downstream Labor-in-Vain brook.	14	High	Start 2020
#2	Sewer Pump Stations and Sewer Treatment Plant	Complete a Sewer System Vulnerability Assessment	24	High	Start 2020
#3	Stormwater System	Evaluate/Implement Stormwater Ordinance and Green Infrastructure Regulatory Review	11	Medium-High	Ongoing
#4	Public Safety Communication	Upgrade the communication system so that all of the public safety departments are operating on the same system.	8	High	Start 2020
#5	Stormwater System	Perform an infrastructure assessment, to include GIS mapping and a vulnerability assessment	7	High	Ongoing
#6	Potable Water Treatment Plant	Develop mitigation steps to reduce flooding and flood impacts to operation by 'hardening' the site and equipment.	7	Medium	Start 2022

Additional actions that were identified by each of the teams during the workshop are listed below:

1) Provide regular maintenance of Power Distribution System (e.g. tree trimming)
2) Planning/Zoning- Review of Zoning Ordinances as necessary
3) Road Infrastructure- Conduct a Vulnerability Assessment of roads to flooding
4) Industrial areas- Evaluate resiliency and flood hazard risk
5) Pump stations in the high velocity flood zone- Evaluate hazard risk of flooding due to storm surge
6) Beaches, dunes, and salt marshes- Maintain existing profiles and reinforce regulatory protection
7) Identify needs to provide backup emergency generator power to critical town facilities.
8) Locate vulnerable neighborhoods or homes of vulnerable residents and assess risk.
9) Perform drone imagery of the entire Somerset coast line to capture existing conditions. This data can be used to understand shoreline changes over time and due to severe weather events. Drone imagery will also help FEMA determine pre-existing conditions of properties that get damaged during severe storms.

Actions identified in a post-workshop meeting with the core planning team which supplement the lists above:

10) Improve resiliency in town emergency operations by conducting exercises and emergency drills to test and update the Emergency Action Plan.
11) Ensure the Somerset Berkley Regional High School shelter has updated its certification in the event of an emergency, and plan for transportation of vulnerable populations to the shelter.
12) Work with the Town of Dighton on land use plans with regards to the watershed supplying potable water to the Somerset Reservoir.
13) Work with MassDOT to ensure the undersized culverts along Route 138 are upgraded to withstand the 1-percent annual chance flood, storm surge, tidal restrictions and improved transportation safety;
14) Address excessive storm water inputs from the upper watershed as a critical issue for the Labor-In-Vain brook.
15) Address erosion and undercutting of the walled/bank due to increased intense storms, storm water flow and tidal influence along Buffington Brook from Riverside Avenue to Route 138;
16) Buffington Brook should be reviewed at the upstream side to evaluate stormwater inputs to see what other problems may exist (impacts of reverse flows during peak high tide/coastal flooding/inundation);
17) Somerset Wastewater Treatment Plan, pump stations, sewer, water and gas lines that are located in the coastal flood zone, should take the necessary measures to secure them from flood waters;
18) Homes on Ripley Street and the Brayton Point neighborhood are vulnerable to erosion of the bluff and flooding from storms. This area should be targeted for outreach and education regarding potential storm threats.
19) Roads and properties in the 1-percent annual chance floodplain should be assessed for shallow (tidal) and coastal flooding hazards and vulnerabilities identified. Riverside Avenue is vulnerable to high tide flooding in several areas along the waterfront and Main Street is low-lying with houses and historic wharfs vulnerable to inundation.
20) Somerset Waterfront Park and Boat Ramp are often under water during coastal storms or moon tides. Storm drains in the parking lot at Waterfront Park back up on a regular basis. The seawall in this area needs major repair, and is about a foot from being overtopped at high tide. The Town has engineered plans and permits to repair the seawall. Measures should be taken to improve and protect this valuable asset from future flooding.

The Town of Somerset participated in a workshop with the Southeastern Regional Planning and Economic Development (SRPEDD) and Resilient Taunton Watershed Network to expand on the MVP planning process to identify existing local, regional, and watershed-based planning documents, discuss current relevancy, and identify gaps to resiliency. The workshop was led by Bill Napolitano, SRPEDD Environmental Program Director. The workshop included discussions that looked at an array of specific threats and potential alternatives, focusing on nature-based solutions and land acquisition to help protect the vulnerable coastline. The workshop was able to build off the threats and priorities identified at the CRB. Participants included key local and regional staff representing municipal management, planning, conservation, public works, and emergency management.

Additional actions identified as part of this MVP Extended scope are listed below:

21) Develop new or review existing bylaws to enhance and foster the use of nature-based solutions to increase resilience following MassAudubon guidelines and available toolbox.

22) Main Street, Pocket Park – (bottom of South Street) is often under water during coastal storms or moon tides. Measures should be taken to improve and protect this area from flooding.
23) Labor in Vain, confluence Taunton River – marsh and culvert on Dublin Street see impacts from storm surge and sea level rise that should be evaluated.
24) Warren Ave seawall and road infrastructure improvements are needed to protect public infrastructure and private property.
25) Broad Cove marsh restoration from erosion due to sea level rise.
26) Broad Cove/Pleasant Street Bridge improvements including future protection to sea level rise and storm surge.
27) Pierce Beach and Bluff's is highly susceptible to erosion. The Town should continue to monitor and consider beach nourishment and nature-based solutions against rising tides.

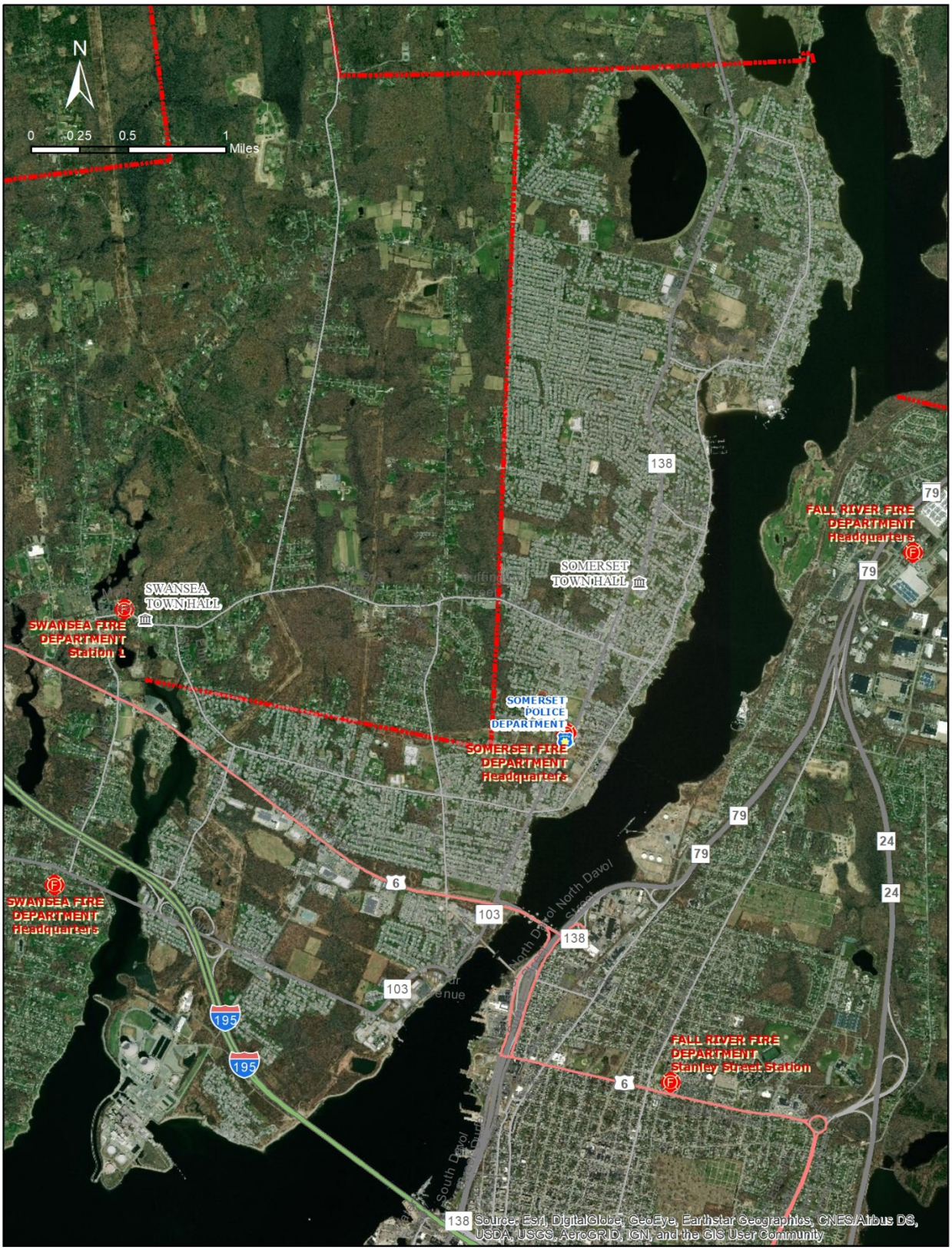
Conclusions and Next Steps

The Town of Somerset successfully identified climate-change related hazards that may have a severe impact, especially if the climate continues to follow expected trends with regards to sea level rise and storm surge, precipitation, and temperature. The Town's vulnerabilities and current strengths to the top hazards were identified and recommendations to improve resiliency were discussed during the CRB workshop and presented at the public listening session. Based on these conversations and discussions, a list of mitigation actions were identified by the CRB Workshop participants and the top priority actions were identified through a voting process and timelines were established and listed in Table 7. Additional actions identified by the Core Team after the workshop have also been included in this report.

With the submission of this report, the Town of Somerset expects to meet the final requirement to become a MVP-certified community, which would allow the Town to become eligible for Action Grants in the future. The Town is committed to prepare and adapt current and future hazards in the face of an ever-evolving climate and becoming a MVP-certified community is an important step towards this goal.

Attachment I

Town of Somerset Map


N
0 0.25 0.5 1 Miles
SWANSEA TOWN HALL
SWANSEA FIRE DEPARTMENT Station 1
SOMERSET TOWN HALL
SOMERSET POLICE DEPARTMENT
SOMERSET FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Headquarters
SWANSEA FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
North Davol Street
South Davol Street
138
79
6
103
195
24
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix I

Core Team Meeting Agenda and Sign-In Sheet

Dewberry

Date: August 27, 2019

Time: 9:00-12:00

Location: Somerset Public Library Meeting Room

Meeting Lead: David Bedoya

Purpose: MVP Core Team Meeting

Agenda Items

9:00 a.m. – 9:15 a.m. **Introductions and Brief Description of the MVP Program,** David Bedoya, Nancy Durfee

Why are we here?. Brief overview of the MVP process

9:15 a.m. – 9:45 a.m. **Goal Setting,** Sarah Hamm, Kelly Rosofsky

What does Somerset need to get to become MVP-certified but most importantly what does Somerset want to get out of the MVP process (what are the most important actions that need to be addressed)

9:45 a.m. – 10:15 a.m. **Community Resilience Building (CRB) Workshop,** David Bedoya, Kelly Rosofsky, Sarah Hamm

Goals of the workshop

Outcomes needed from the workshop to become MVP-certified

Leveraging the MVP process to pursue other opportunities

10:15 a.m. – 10:45 a.m. **Hazards and Available Data** | Sarah Hamm

Review Somerset specific hazards and data (HMP)

Provide menu of workshop map and hazard data options

Review existing town plans and data related to workshop (i.e. critical facility, transportation data)

10:45 a.m. – 11:15 a.m. **Workshop Logistics and Materials,** Nancy Durfee, David Bedoya, Kelly Rosofsky, Sarah Hamm

Decide on:

1. Date/Time/Format of the Workshop
2. Participant List and Outreach
3. Location
4. Table Arrangements- single sector, mixed sector, location
5. Role of Core Team members and Scribes
6. Proposed format for workshop deliverables

11:15 a.m. – 11:30 a.m. **Milestones between Now and the Workshop,** David Bedoya

Milestones and action items that need happen before the workshop. Formalize what is going to be done “before”, “during” and “after” the CRB workshop

12:00 p.m. **End Meeting**

8.27.2019

Sign In

Name	Department	E-mail
Scott Jepson	Fire / EMA	CHIEFJEpson @ AOL.com
Shauna Geary	COA	coa@town.Somerset.ma.US
Richard Brown	town Admin	
Jeff Schoonover	School Dept	schoonoverj@sblregional.org
George Meade.l	Somerset Police	g_meade.l@Somersetpd.org
Bob Bozikurski	Water & Sewer	rbozikurski@gmail.com
Paul Boucher	Building	PBOUCHER@TOWN.SOMERSET.MA.US
Barry Funtaine	Recreation	bfontaine@town.somerset.ma.us
Tim Turner	Bd of Health / Con Com Agent	TTurner@Town.Somerset.ma.us

Appendix II

Hazards Identified in the CRB Workshop

CRB Workshop Identified Hazards

Participants of the CRB workshop named the following list of hazards for Somerset.

1. Dam breach
2. Hurricanes (surge)
    a. Severe wind- High Frequency High Wind Warning, Med to Low Frequency Hurricane Wind Warning
    b. Coastal flooding- medium frequency- climate related
3. Nor'easters (snow + ice)
    a. Snowfall- high frequency
    b. Ice storms- low frequency
4. Heavy rainfall events
    a. Medium Frequency
    b. Urban flooding
    c. Climate related
5. Cloud burst/high intensity storm events
    a. Severe wind (thunderstorms)
    b. Lightning- High Frequency for the county
6. Hail
    a. Medium to high frequency
7. Tornadoes/Microbursts
    a. Severe wind
8. Drought
    a. medium
9. Extreme temperature (hot or cold)
    a. Heat- medium frequency
    b. Cold- medium frequency

Participants also named the following Hazard Impacts

1. Scour to Roads during rain/surge events
2. Standing waters (EEE) -→ Should this be Increase in vector-borne diseases?
3. Coastal, Long-Term erosion (marinas, parks, structures)
4. Nuisance flooding (tides)

CRB Workshop Top Hazards per Team

Green Team

1) WWTP Infrastructure Resilience Improvements (3)
2) Water Treatment, Pump Station, move, harden, etc. (3)
3) Maintenance of Power Distribution System (e.g. tree trimming) (1)
4) Public Safety Complex- Communication System Upgrade (3)

Red Team

1) Dam/Reservoir- Culvert Size Increase, alternative. Analysis through MEPA- Flooding/Dam Failure (14)
2) Sanitary- Vulnerability Assessment (Flooding)- Pumps, Wastewater Treatment Plant (10)
3) Planning/Zoning- Review Zoning Ordinances- Smart Development, Green Infrastructure (11)
4) Road Infrastructure- Vulnerability Assessment of roads, Flooding (0)
5) Communications- Expand to all departments for emergencies (6)

Blue Team

1) Dam- maintain to reduce risk (5)
2) Water Treatment Plant- Maintain and Upgrade (4)
3) Industrial areas- evaluate resiliency and flood risk (5)
4) Wastewater Treatment Plant- Maintain and conduct feasibility studies for resilience (3)
5) Pump stations- some?? in the high velocity zone. Evaluate risk of flooding due to storm surge. (1)
6) Beaches, dunes, salt marsh- maintain existing profiles and regulatory protection (4)

Yellow Team

1) Dam- Improvements to mitigate hazard (14)
2) Pump sewer stations and sewer treatment plant- Make infrastructure more resilient, assessment of system (9)
3) Storm water infrastructure vulnerability assessment (7)
4) Emergency power for critical town buildings. (2)

Appendix III

CRB Workshop Sign-In Sheet

Sign-In Sheet

First Name	Last Name	Affiliation	E-mail Address
Richard	Brocon	Somerset	rbrocon@town.somerset.ma.us
Elaine	Pereira	Brayton Point LLC	epereira@braytonpointllc.com
Rachel	FLECK	MEMA	rachel.fleck@mass.gov
Timothy	Turner	Somerset BOH	TTurner@Tswm.somerset.ma.us
Courtney	Rocha	EEA	courtney.ROCHA@mass.gov
Bob	Bozikowski	Somerset Water/Sewer	rbozikowski@gmail.com
PAUL	BOUCHER	SOMERSET BUILDING	PBOUCHER@TOWN.SOMERSET.MA.US
Shauna	Geary	SomerSet COA	coa@town.Somerset.ma.us
George	McNeil	Somerset Police	g.mcneil@somersetpd.org
William T	Bissonnette	Bissonnette Rlty	Bill@Housetrain.com
melanie	Bissonnette	Riverside Realty	Melanie@Houseteam.com
Matt Bissonnette	Bissonnette	Riverside Realty	Matt@Houseteam.com
MATHew	Talbot	SBRHS/SPS	talbotm@Sbregional.org
SCOTT	JEPSEN	SOMERSET FIRE/EMA	CHIEFJEPSEN@AOL.COM
EDWARD	WHEELER	BRAYTON POINT	TWRUMFORD@MSN.COM
PETER Ducios	Ducios	Gladding-Hearn	peterd@gladding-hearn.com
ANN	Malley	National Grid	ann.malley@nationalgrid.com
DAVE	JANIK	MA CONTACT TONE MGMT	DAVID.JANIK@MASS.GOV
BARRY	FONTAINE	Recreation Department	bfontaine@town.somerset.ma.us
CHRIS SIMONS		Somerset Highway	CSIMONS@town.somerset.MA.US
TONY KUCIKAS	KUCIKAS	SOMERSET CITIZEN	KUCEKAK@COMCAST.NET
JOHN	MCNUITY	PATRIOT STEVEDORING	JMCNUITY@PATRIOTSTEVEDORING.COM
Bill	Napolitano	SRPEDD	bnap@srpedd.org
Scott	Choquette	Dewberry	SChoquette@dewberry.com

(23)

Town of Somerset MVP Workshop **October 15, 2019**

Sign-In Sheet

First Name	Last Name	Affiliation	E-mail Address
Sarah	Hamm	Dewberry	Shamm@dewberry.com
Kelly	Rosofsky	Dewberry	Krosofsky@dewberry.com
David	Bedoya	Dewberry	dbedoya@dewberry.com

Appendix IV

CRB Workshop Risk Matrices

Yellow

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	Coastal Flooding/ Storm Surge	Inland Flooding	Wind/ Hurricane	Ice/Snow Blizzard	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam Breach	North End	Town	V		Emergency Action Plan & Dam improvements	to control flooding & SAFE		H	S
Sewer Plant/Pump Station	Coastal	Town	V	Plan and ~~Storm~~ Resilient	Funding to	make facilities more		H	O
Roadways	Coastal	Town	V	Mapping &	planning for low lying areas.			M	S
Storm Infrastructure	Town Wide	Town	V	Improvement	Program and Plan.	Funding to	implement	H	O
Drone Survey	Coastal	Town	V	Need to map prior to storms.				L	S
Societal									
Emergency Planning	Town Wide	Town	S	Hazard Mitigation Plan.				H	O
Shelter - High school	central	Town	S			Designated	shelter	H	O
Emergency Power Town Building	Town Wide	Town	V		Need Assessment and Plan.		implementation	M	S
Resident Emergency Planning	Town Wide	Town	V		Education program/resources			L	S
Environmental									
Wetlands Protection/Restoration	Town Wide	Town	V	Need plan	and program			L	L
Nature Based Solution	Town Wide	~~Private~~ Town	V	Need program.				L	L
L Relocation residents in town/Hazard locations									

Blue Team

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	Dam Breach	Noreaster Hurricane	Rain Events - Continuous Bursts	Priority H-M-L	Time Short Long Ongoing
Infrastructural								
Water Treatment Plant	1	town	V	maintain Dam to lessen risk of failure	Evaluate alternatives to reduce flow into the reservoir		H	L
Industrial Areas Wate	multiple	private	V		Evaluate Resiliency of Industrial Areas		M	L
Waste Water Treatment Plant	1	town	V		Conduct feasibility study of alternate site		H	O,L
Societal								
Environmental								
Pump Stations / WWTS	multiple	town	V		VE zones vulnerability study to evaluate risk due to storm surge, flooding		H	L
Beaches + Dunes	multiple	public private	V/S		maintain existing profile		M	O
Salt Marsh	multiple	public private	V/O		maintain existing profiles maintain regulatory protection		M	O

RED TEAM

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	Rain event	Hurricane surge/flooding	Nor'easter (snow & ice)	Wind	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam Breach/Reservoir	multiple	Town	V	increase size of culverts	avoid dam failure Flooding	MEPA Alt analysis		H	O
Sanitary System		Town	V	Vnerability study of entire System (Pumps,				H	O
Road infrastrucre	multiple	Town	V	Vunerability study of Roads to determine				M/H	O
Location of Fire & Police	county st.	Town	S	Located high of the coast to Respond		continually From Facility Allows police and fire		H	
Power Grid	multiple	Private	S	Increased capacity, new sub-stations and lines				H	O
Collection/treatment Storm water runoffs	multiple	Town	V	aggresivly pursue storm water mangment directed by MS4.		as		M/L	
Societal									
Elderly citizens	multiple	Private	V	Coordinate emergency Mangment Plan				M	
Vunerable neighborhoods	multiple	Private	V	Identify locations and		level of risk		H	
Full time Fire and Police		Town	S					M	
First net public safety comm		Town	S	Expand First Net to		all public	safety	H	
Robust municipal organization		Town	S					H	
Planning and Zoning			V	Review of low impact		our zoning ordinances Smart development.	to ensure	H	
Environmental									
Reservoir	m	Town	V					H	
Key industrial Sites	multiple	Private	V	Identify potential hazards or existing		sites to share with	any new	M	
Protected Lands		Town/Private	S						
Topography	multiple	Town, Private	S						
Sanitary System			V/S					H	
Vunerable neighborhoods			V	identify locations		and levels of	Risk	H	

#1
#2
#3

Green Team

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	Floods	Hurricanes	Nor'easters	Farming Tsgs	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
DAM	SPECIFIC	TOWN	V	INFRASTRUCTURE UPGRADES				H	$
WATER WATER TREATMENT PLANT	SPECIFIC	TOWN	V	"	"	"		H	S
WATER TREATMENT PLANT	SPECIFIC	TOWN	V	"	"	"		M	O
PUMP STATIONS	MULT.	TOWN	V	RELOCATE ?	"	"		H	O
ELECTRICAL DIS SYSTEMS	MULT	PRIVATE	V	MAINTENANCE (TREES)		UPGRADES		H	O
PUBLIC SAFETY COM	SPEC	TOWN	V	MAINTAIN				M	O
Societal									
HOUSING AUTHORITY	SPEC	TOWN	V	100 % ELECTRIC				H	S
VULNERABLE NEIGHBORHOOD	SPEC	TOWN	V	DRAINAGE PT				H	S
HIGH SENIOR POPULATION	MULT	TOWN	V	NO TRANSPORTATION				H	S
SCHOOLS	MULT	TOWN	V	MINIMAL SHELTERING		ABILITY / clinician car		H	O
PORTUGUESE POPULATION	MULT	PRIV	V	UNABLE TO COMMUNICATE				M	O
Environmental									
BIG RED SLIDE	SPEC	TOWN	V	?	? RECREATION			M	O
WATERWATER	MULT	"	V	TOWN, MARINAS,		BOAT RAMP	PUMP OUT	H	S
WATERFRONT PARK	SPEC	"	V					H	S
DRAINAGE PT BEACH	SPEC	"	V		RECREATION			L	L

Appendix V

CRB Workshop Top Priority Actions

Yellow Team

1. Dam – Improvements to mitigate hazard (14)
2. Sewer Pump Stations and Sewer infrastructure TP – Make more resilient, Assessment of system
3. Storm water Infrastructure Vulnerability Assessment
4. Emergency Power for critical town Buildings

Blue Team

① Dam. → maintain to reduce risk

② WTP → maintain and upgrade

③ Industrial areas – evaluate resiliency and flood risk

④ LW WTP – maintain and conduct feasibility studies for resilience

⑤ Pump stations – some in the high velocity zone. Evaluate risk of flooding due to storm surge

⑥ Beaches, dunes, salt marsh – maintain existing profiles and regulatory protection

RED TEAM

2. DAM/Res → culvert size ↑, alternative Analysis through MEPA → Flooding/Dam Failure (14)

1. Sanitary - Vulnerability Assessment + (pumps, WWTP (Flooding))

3. Planning/Zoning - Review Zoning ordinances Smart Development & Green Infrastructure (11)

4. Road Inf. - Vuln. Assessment OF Road Flooding

5. Communications - Expand to All Departments For emergencies.

~~Floods~~

Green Team

1. ~~Dam infrastructure~~

1. WWTP Infrastructure Resilience Improvements

2. Water treatment pump s.t. (move)
   - move
   - harden, etc.

3. Maintenance of Power Distribution system (e.g. - tree trimming) (3)

3. Public Safety Complex Communication system upgrades (3)

Appendix VI

CRB Workshop Materials

- CRB Workshop Agenda
- Power Point Presentation
- Maps
- Example of Filled-Out Risk Matrices

Dewberry

MVP WORKSHOP AGENDA

Date: October 15, 2019
Time: 2:30 – 7:30 pm
Location: Somerset Berkeley Regional High School Library
Meeting Facilitator: David Bedoya
Purpose: Town of Somerset, MA MVP Workshop

Agenda Activities

2:30 p.m. – 2:35 p.m. **Welcoming Remarks ~** Richard Brown, Town Administrator

2:35 p.m. – 2:45 p.m. **Introductions and Overview of the Workshop ~** David Bedoya, Dewberry

2:45 p.m. – 3:10 p.m. **Overview Presentation on Science, Hazards, Past Planning Efforts and Outcomes**

- Recent Climate History and Projections
- HMP vs. MVP Program
- Past and current hazards
- Present summary of recent/existing planning efforts

3:10 p.m. – 3:35 p.m. **Meet and Greet**

3:35 p.m. – 3:50 p.m. **Listening session**

- Bob Bozikowski, Water/Sewer Superintendent
- Scott Jepson, Fire Chief and Emergency Manager
- Tim Turner, Board of Health/Conservation Agent

3:50 p.m. – 5:00 p.m. **Whole Group Discussion – Identify Town of Somerset Hazards**

- Identify hazards from HMP relevant to climate change
- Identify past and current hazards (hazards that may be exacerbated by climate change)
- Future hazards (new hazards that may occur due to impacts of climate change)

5:00 p.m. – 5:45 p.m. **Dinner Break**

5:45 p.m. – 6:45 p.m. **Breakout into Small Groups**

- Identify top 3-4 hazards (add to Risk Matrix)
- Identify Infrastructure, environmental, and societal strengths and vulnerabilities (add to risk matrix)
- Each group reports out top 4-5 priority community actions

6:45 p.m. – 7:25 p.m. **Whole Group Discussion – Determine Overall Priority Actions**

- Team Leader will discuss identified infrastructure, environmental, and societal vulnerabilities and strengths with prioritized actions
- Create a “short-list” of priority actions (3-5)
- Define urgency and timing of actions

7:25 p.m. - 7:30 p.m. **Closing Remarks and Adjourn ~** Nancy Durfee, Town Planner

Dewberry

MVP Workshop

Town of Somerset, MA

October 15, 2019

Today's Agenda

- 2:30 p.m. – 2:35 p.m. **Welcoming Remarks**
- 2:35 p.m. – 2:45 p.m. **Introductions and Overview of the Workshop**
- 2:45 p.m. – 3:10 p.m. **Overview Presentation on Science, Hazards, Past Planning Efforts and Outcomes**
- 3:10 p.m. – 3:35 p.m. **Meet and Greet**
- 3:35 p.m. – 3:50 p.m. **Listening session**
- 3:50 p.m. – 5:00 p.m. **Whole Group Discussion – Identify Town of Somerset Hazards**
- 5:00 p.m. – 5:45 p.m. **Dinner Break**
- 5:45 p.m. – 6:45 p.m. **Breakout into Small Groups – Vulnerabilities, Strengths and Community Actions**
- 6:45 p.m. – 7:25 p.m. **Whole Group Discussion – Determine Overall Priority Actions**
- 7:25 p.m. – 7:30 p.m. **Closing Remarks and Adjourn**

Introductions

- Town of Somerset MVP Core Team
- Stakeholders
- Facilitators

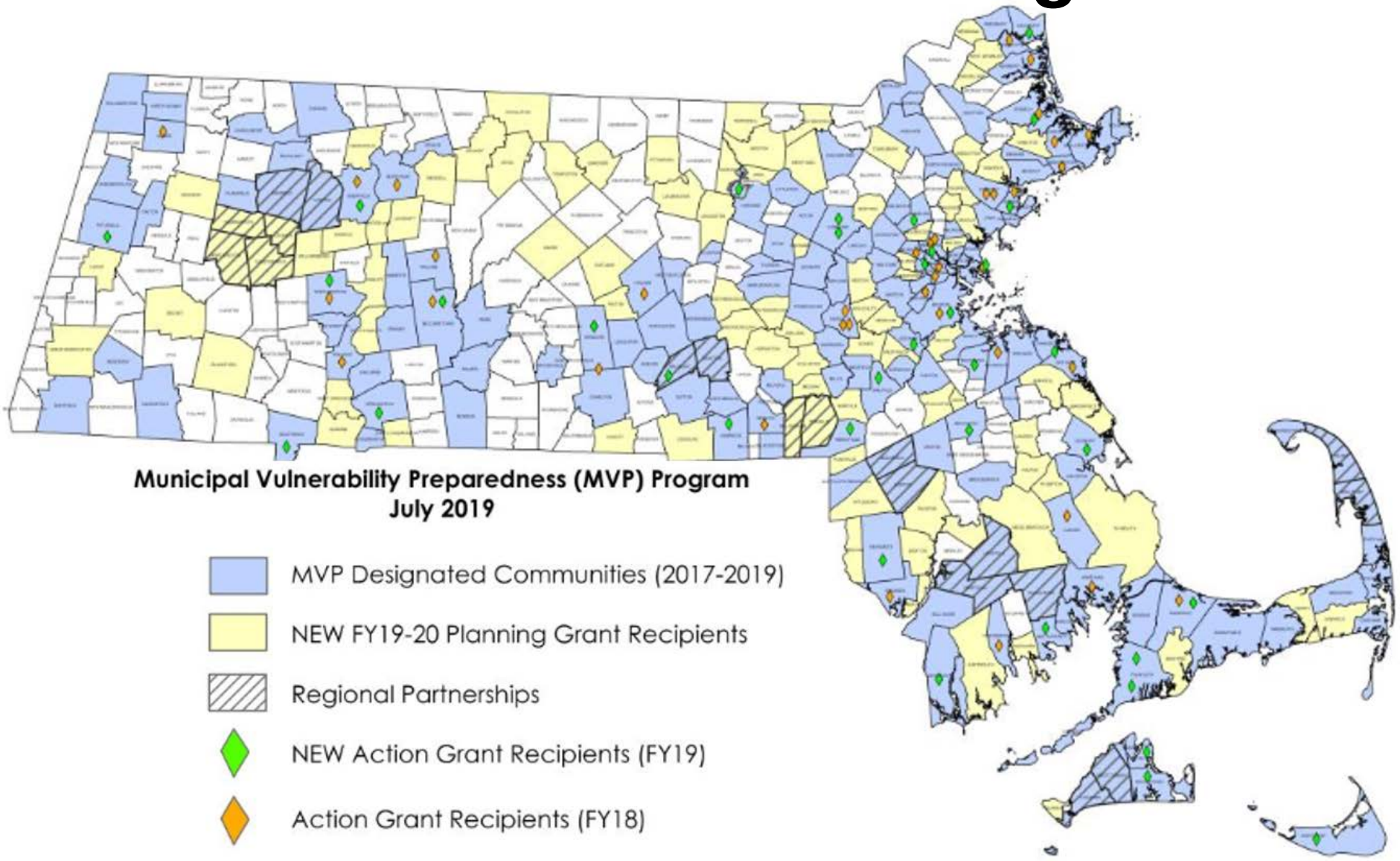
Overview of the MVP Program

Main Goal: Ensure the Town is resilient and prepared in the face of climate change

- The Municipal Vulnerability Preparedness (MVP) Program is run by the MA Executive Office of Energy and Environmental Affairs (EOEEA)
- The goal of the MVP Program is to support cities and towns as they build resilience towards climate change via planning and action grants

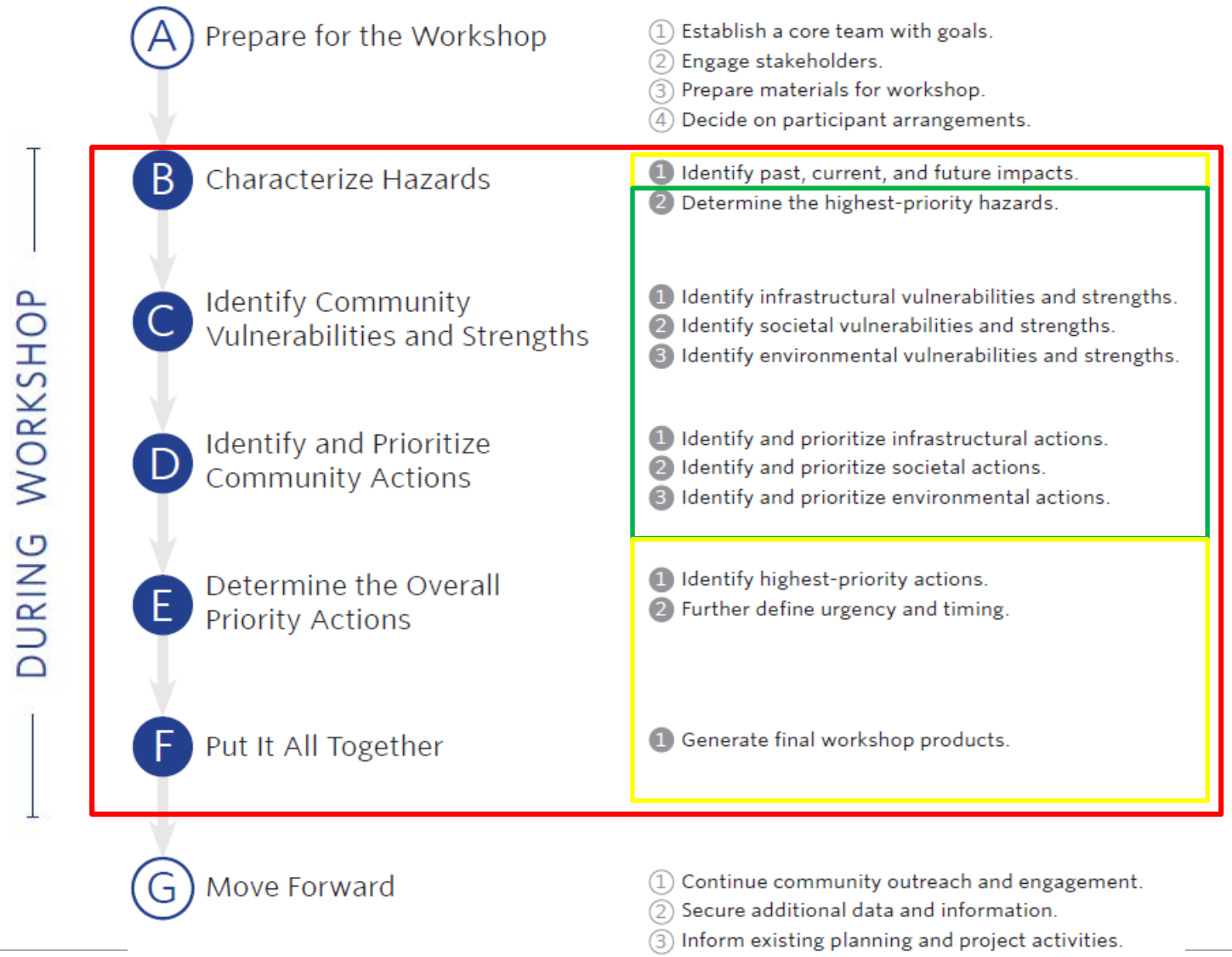
Dewberry

Overview of the MVP Program



Dewberry

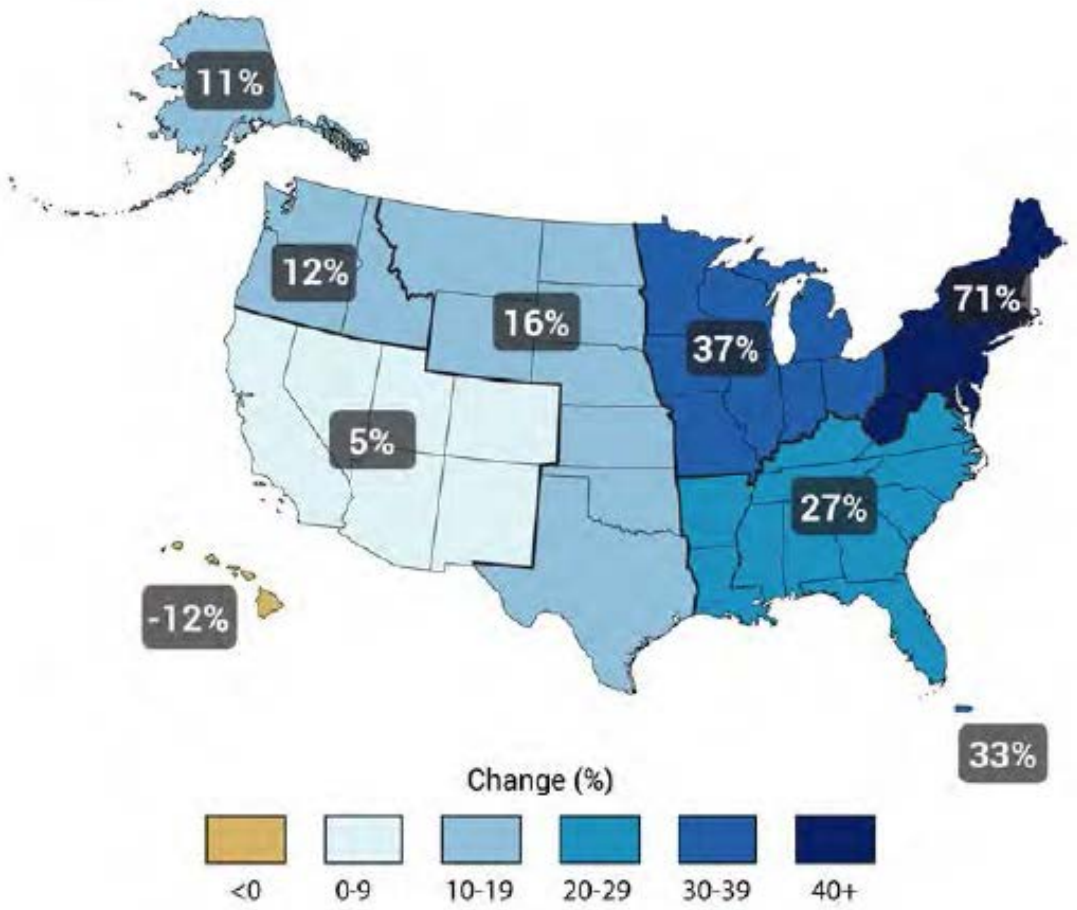
Resilience Building Workshop



Dewberry

Climate Recent History

Precipitation



Observed Change in Very Heavy Precipitation Events (Top 1% of All Daily Events) from 1958 to 2012

Source: 2014 U.S. National Climate Assessment Report

Dewberry

Climate Recent History

Precipitation

2018 Was The State's Rainiest Year On Record

February 05, 2019 | By Benjamin Swasey

Last year was Massachusetts' rainiest on record. Here, rain falls at Fenway Park before a World Series game. (Jesse Costa/WBUR)

90.9 wbur

Let's hope you had a good umbrella.

About 61 inches of rain fell on Massachusetts in 2018, the wettest year on record for the state, with 3 feet falling in the second half of the year.

The 2018 mark was more than 16 inches above Massachusetts' 20th-century average, continuing the slight upward trend in the state's annual average precipitation. You can see that trend here:

10 BOSTON

From July 2018 through June 2019, the average precipitation in Massachusetts totaled 61.87 inches. That's more than 17 inches above average and is now the wettest 12-month stretch in the state's 124 years of record keeping.

Both Connecticut and Rhode Island also set new records, with more than 60 inches of rain reported in those states. That's 17 to 20 inches above average.

Downpours producing these high rainfall totals are becoming more common, especially here in the Northeast, as the climate warms.

Climate Recent History

Coastal Impacts

Report: Boston Saw Record High-Tide Flooding Last Year

June 06, 2018 | By WBUR News & Wire Services

A car sits in floodwaters from Boston Harbor on Long Wharf, during the early January nor'easter. (Michael Dwyer/AP)

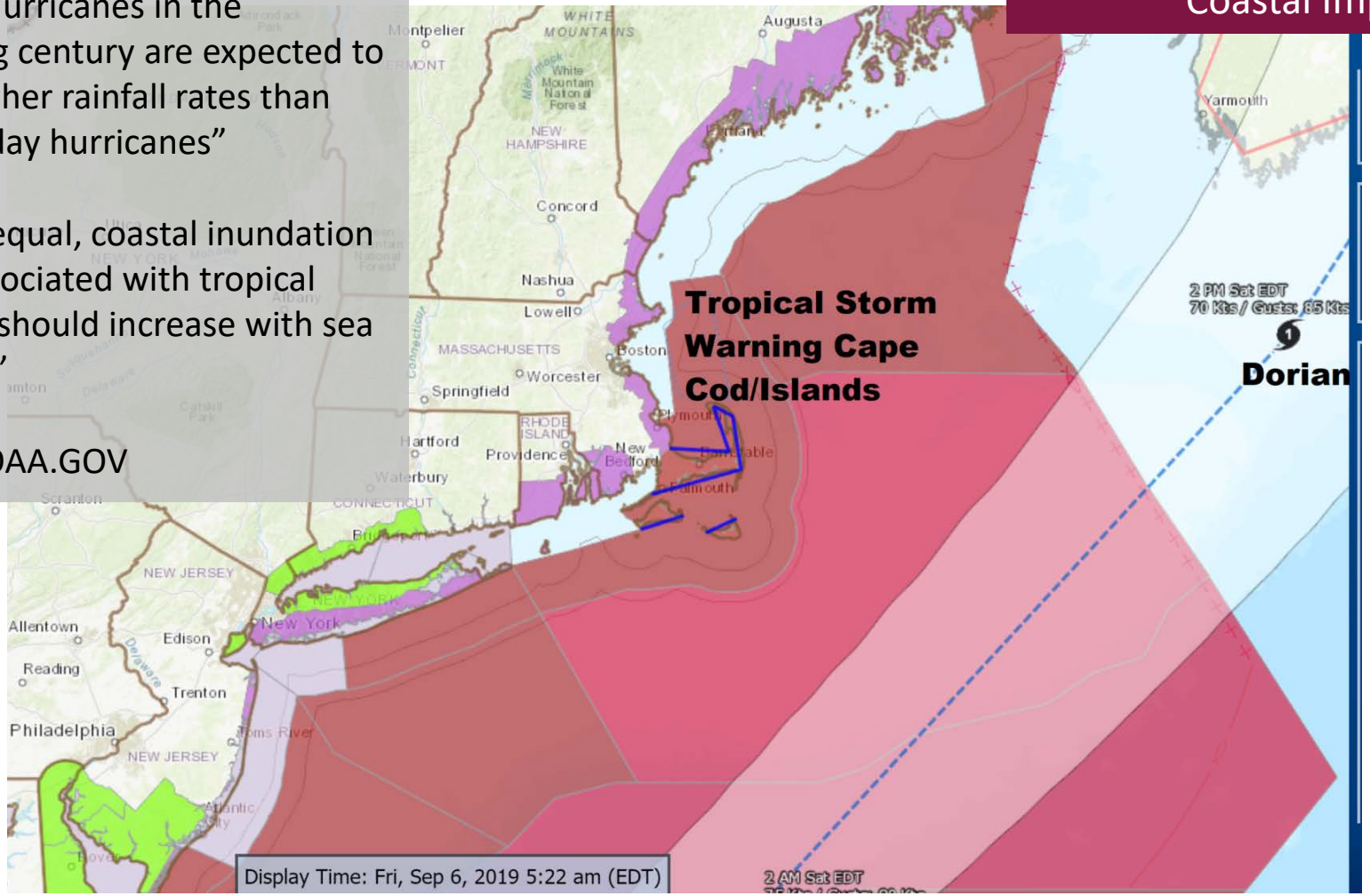
Climate Recent History

Coastal Impacts

Atlantic hurricanes in the upcoming century are expected to have “higher rainfall rates than present-day hurricanes”

“All else equal, coastal inundation levels associated with tropical cyclones should increase with sea level rise”

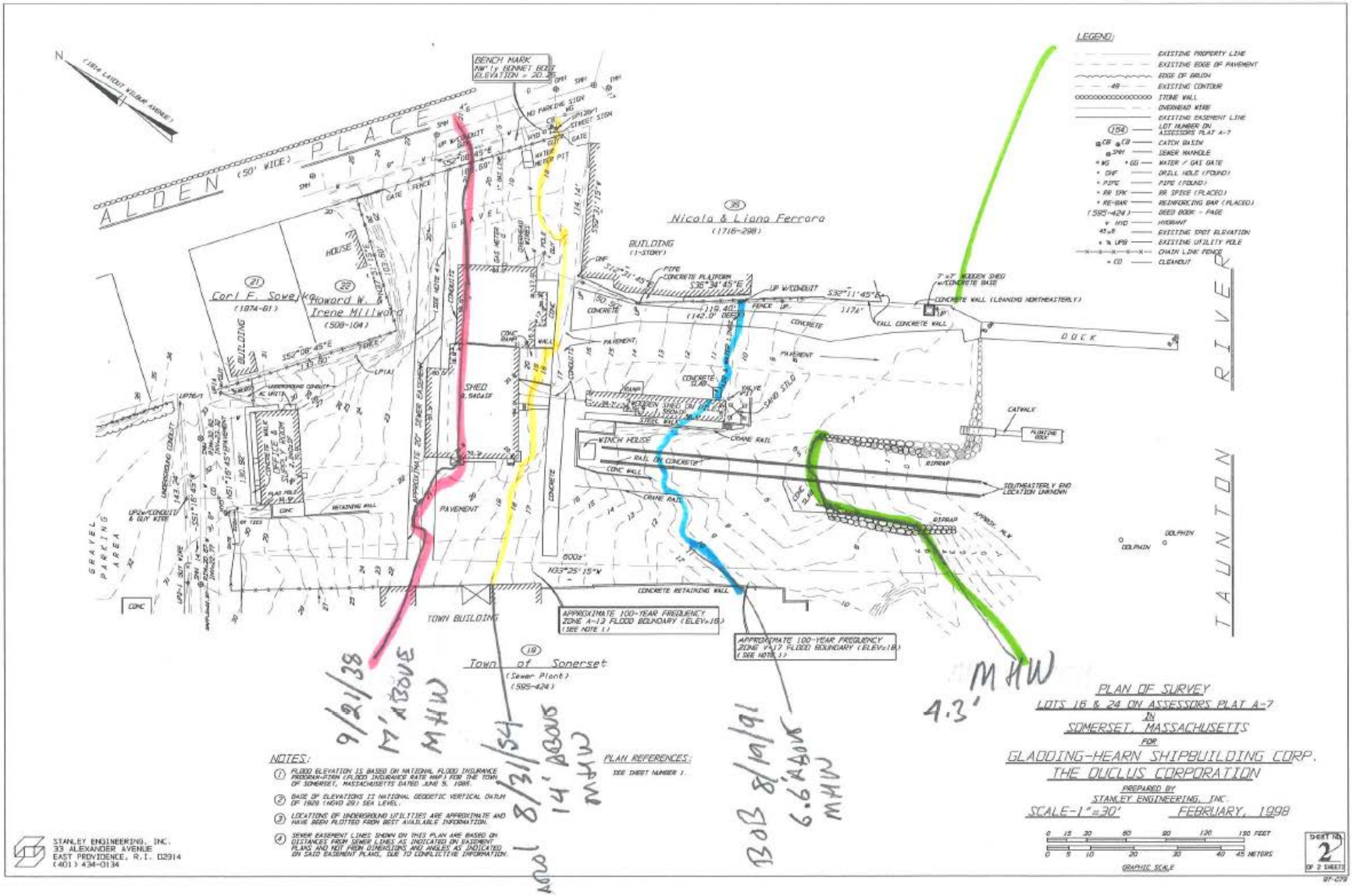
GFDL.NOAA.GOV



Dewberry

Climate Recent History

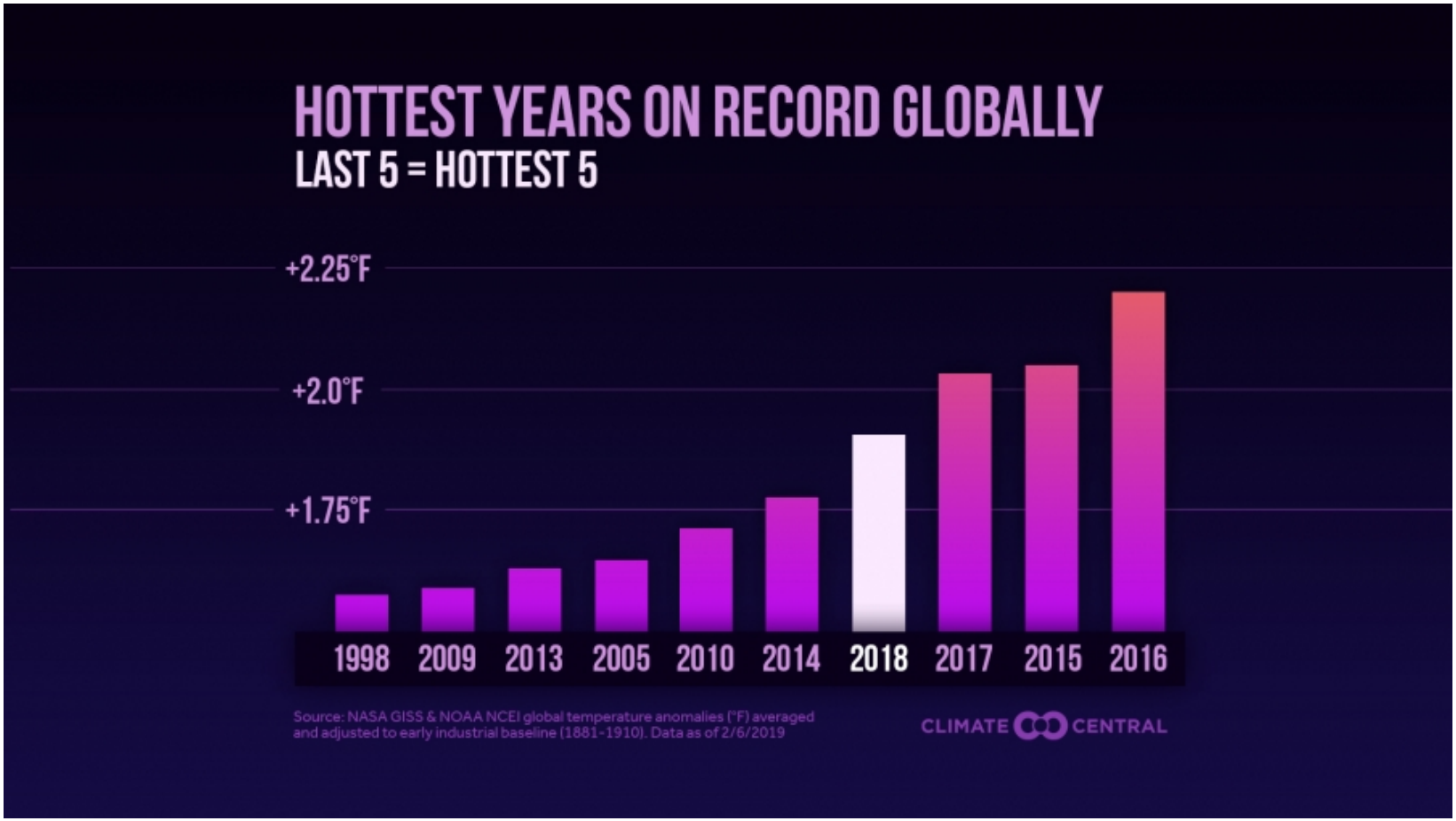
Coastal Impacts



Dewberry

Climate Recent History

Temperature



Dewberry

Climate Recent History

Temperature

90.9 wbur

Listen Live
Explore Audio
Schedule
Programs + Podcasts

CitySpace
Donate Your Car
Membership
Jobs At WBUR
About WBUR
Campaign For WBUR

On Point
Here & Now
Radio Boston
Only A Game
Modern Love
CommonHealth
Cognoscenti
The ARTery

Boston Sweats Through Its Hottest July On Record

July 30, 2019 | By David Epstein

Glauco Cavina, of the Charles River Watershed Association, takes a temperature reading of the Charles River earlier this month. (Jesse Costa/WBUR)

Dewberry

Climate Recent History

Ecosystem Impacts

'60 Minutes' went to Cape Cod to learn more about great white sharks. Here's the report.

"On Cape Cod this summer, shark sightings and beach closings were about as common as lobster rolls."

In this May, 22, 2019, photo, a woman walks with her dogs at Newcomb Hollow Beach. –*The Associated Press*

THE NEW YORKER

THE SUMMER OF SHARK POLITICS ON CAPE COD

By Adam Gopnik August 22, 2019

Dewberry

Climate Recent History

Four times as many mosquitoes test positive for EEE than in years past

▲ HIDE CAPTION

State Epidemiologist Dr. Catherine Brown told The Standard-Times on Tuesday that the number of EEE-positive mosquitoes detected in the state this year is "substantially higher" than in previous years, and a presentation she gave this month suggests the number has quadrupled. [Taunton Gazette File Photo]

Vector Borne Disease

SouthCoastTODAY

The weather is a factor in EEE. The cycle begins the previous fall, the epidemiologist said.

Massachusetts had a lot of rain going into the fall of 2018. That's important, Brown said, because the mosquitoes responsible for spreading EEE among birds live in red maple and white cedar swamps, where they lay their eggs in pockets of water under tree roots. They need enough water to survive until the spring, she said.

This year's spring and summer precipitation allowed mosquitoes to breed repeatedly through July. And warm temperatures — even average summer temperatures — speed up the rate at which mosquitoes reach reproductive maturity, she said.

Those factors have resulted in a fairly large mosquito population this summer, "which definitely plays into what we're seeing with Triple E," Brown said.

Climate Recent History

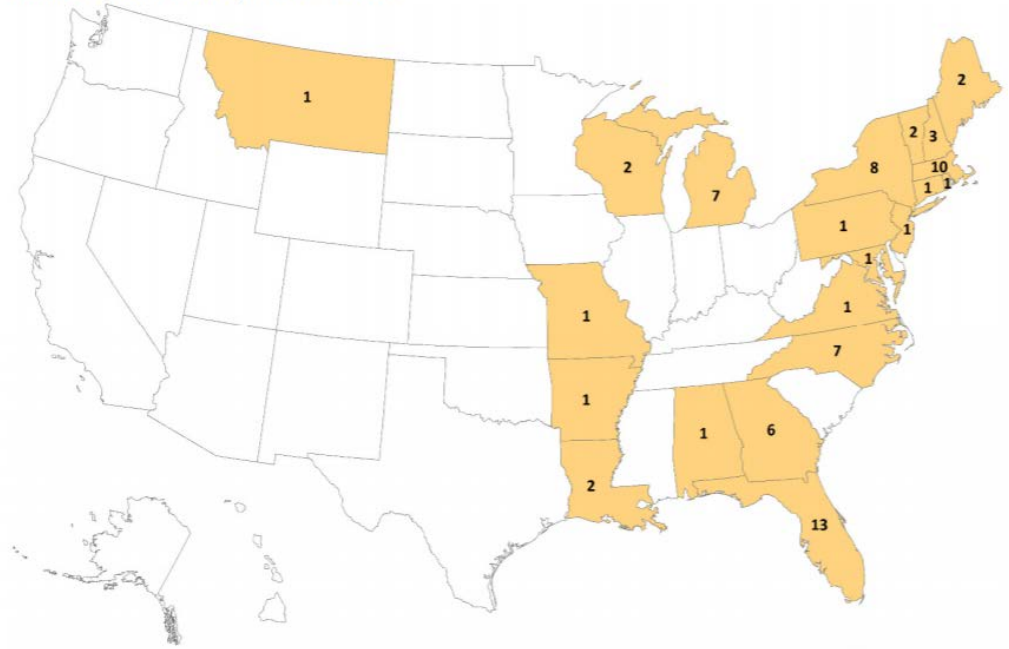
Vector Borne Disease

8th human case of EEE confirmed in Mass., officials say

A man in his 50s from Bristol County was diagnosed with the rare mosquito-borne virus, according to the Department of Public Health.

–Pat Wellenbach / AP, File

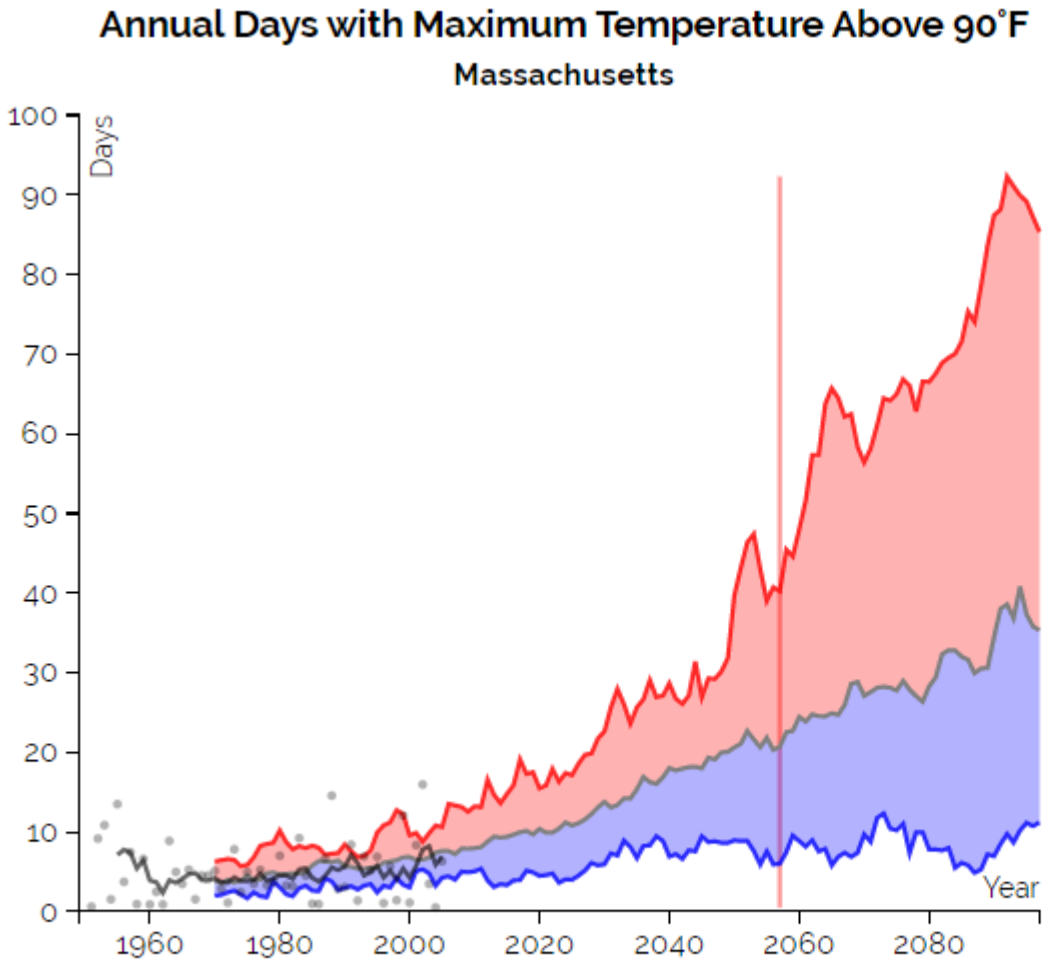
Eastern equine encephalitis virus neuroinvasive disease cases reported by state of residence, 2009–2018



Source: ArboNET, Arboviral Diseases Branch, Centers for Disease Control and Prevention

Dewberry

Climate Projections



Temperature

Observed

days

5-yr Mean

Modeled days 2055–2059

Max	40.24
Median	20.69
Min	5.99

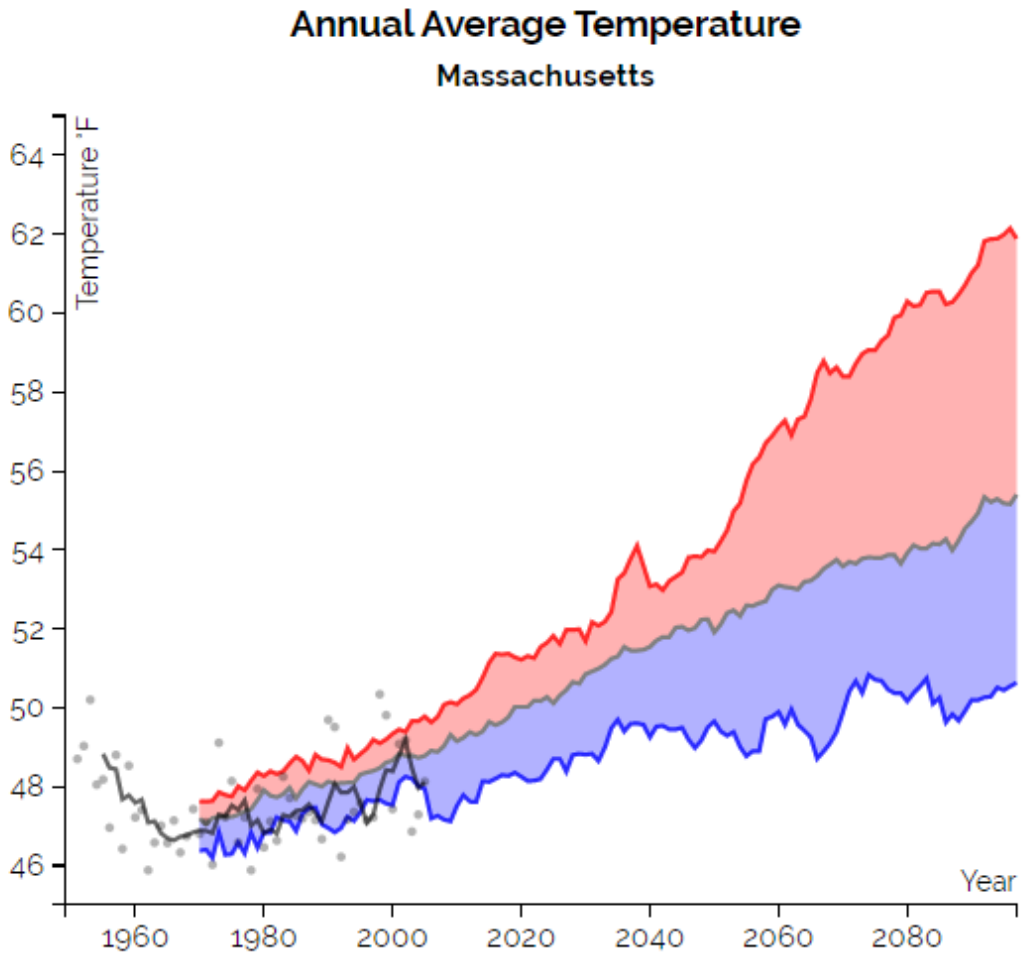
Changes from 1971-2000 for:

2020 - 2049	11.19 days
2040 - 2069	17.75 days
2060 - 2089	24.51 days
2080 - 2097	29.21 days

Dewberry

Climate Projections

Temperature

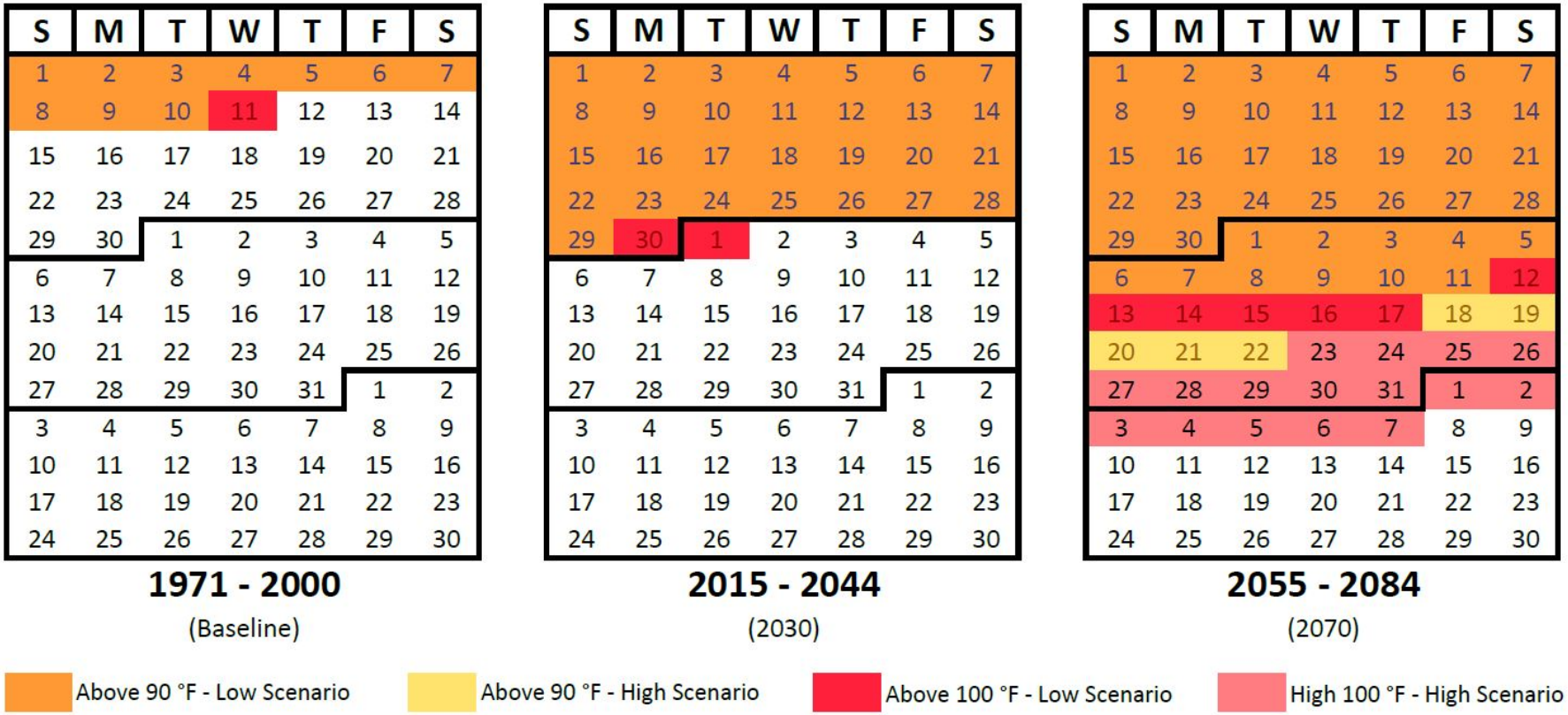


Observed	
	°F
5-yr Mean	
Modeled °F	
Max	
Median	
Min	
Changes from 1971-2000 for:	
2020 - 2049	4.05°F
2040 - 2069	5.30°F
2060 - 2089	6.57°F
2080 - 2097	7.19°F

Dewberry

Climate Projections

Temperature

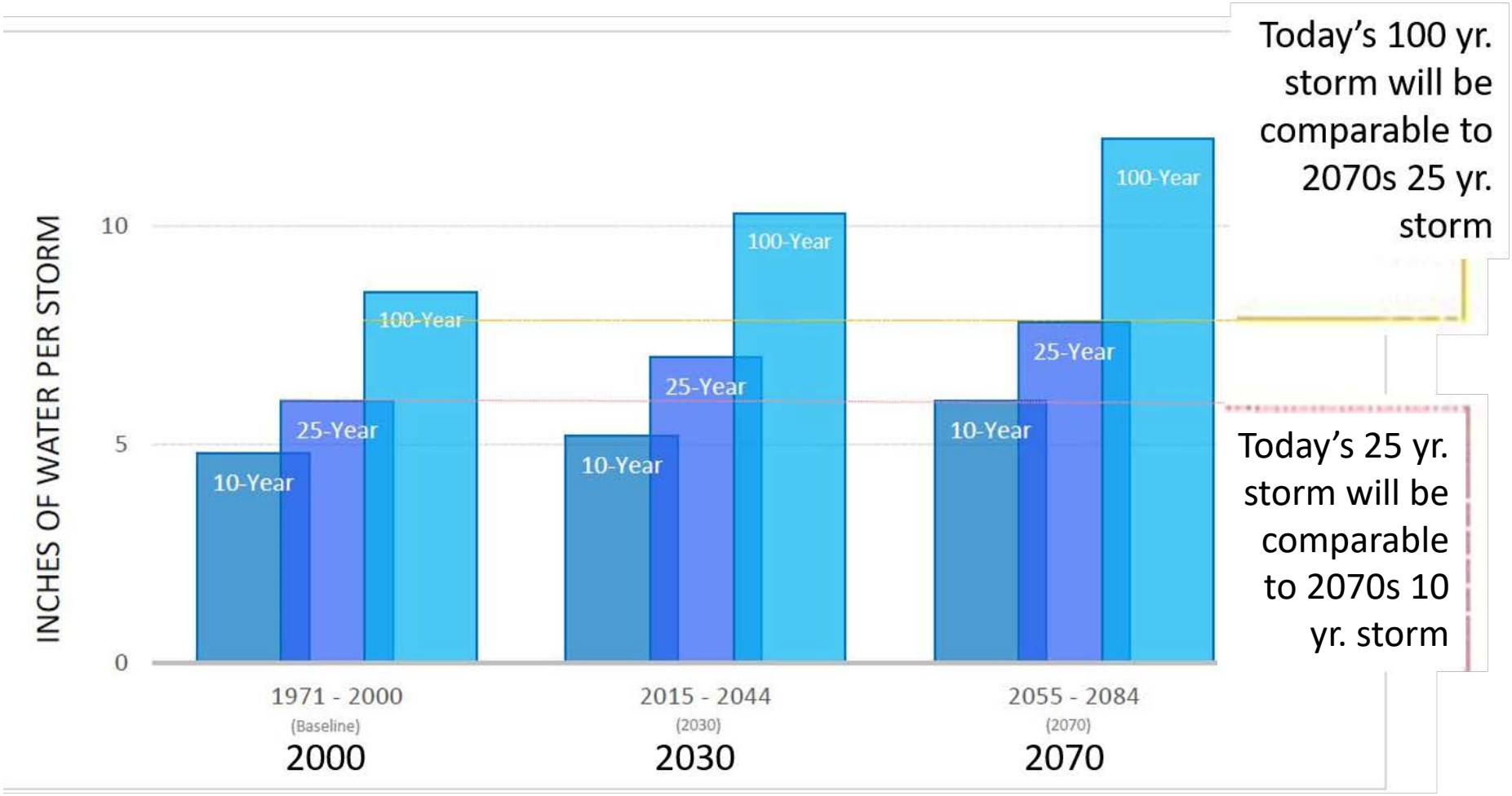


Source: 2015 Cambridge CCVA, Part 1

Dewberry

Climate Projections

Precipitation Flooding



Source: 2015 Cambridge CCVA, Part 1

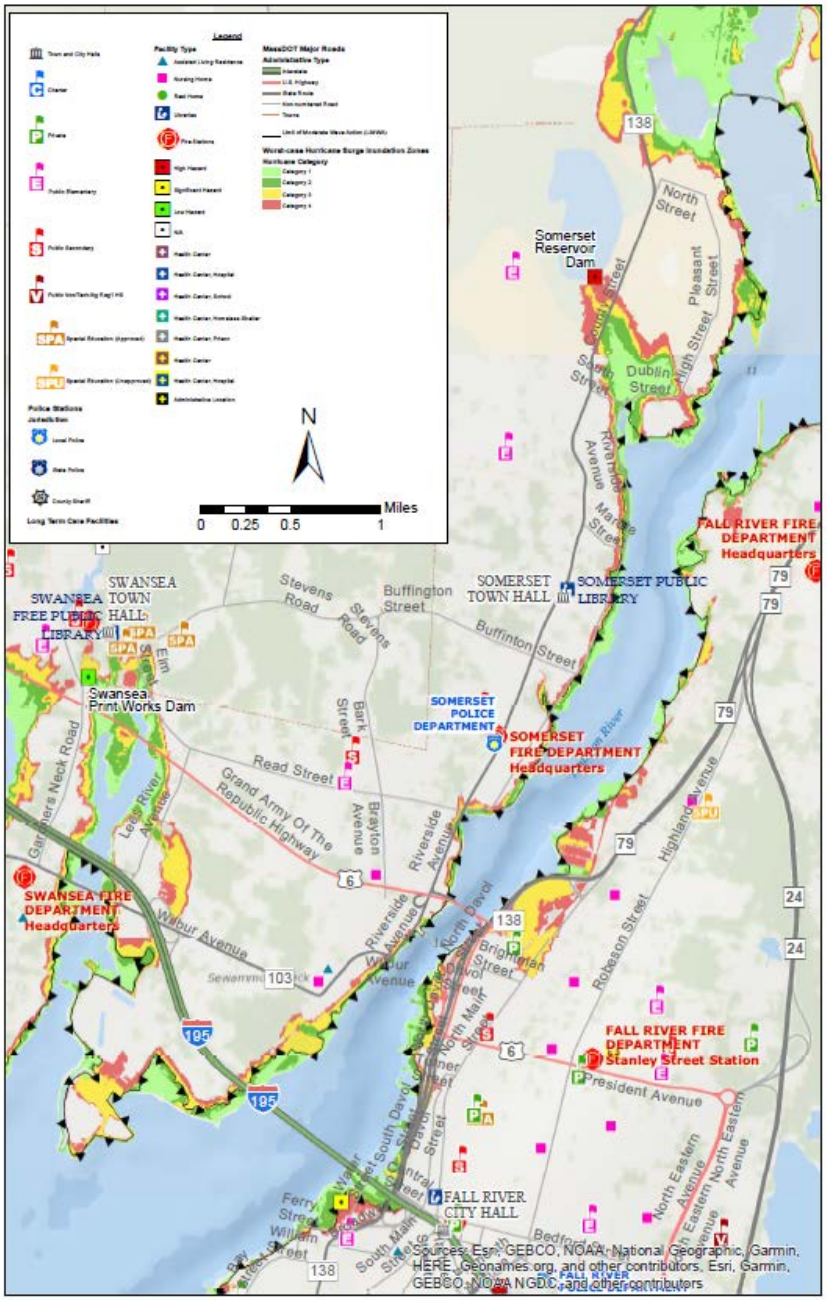
Dewberry

Climate Projections

Coastal Flooding

Sea Level Rise and Storm Surge

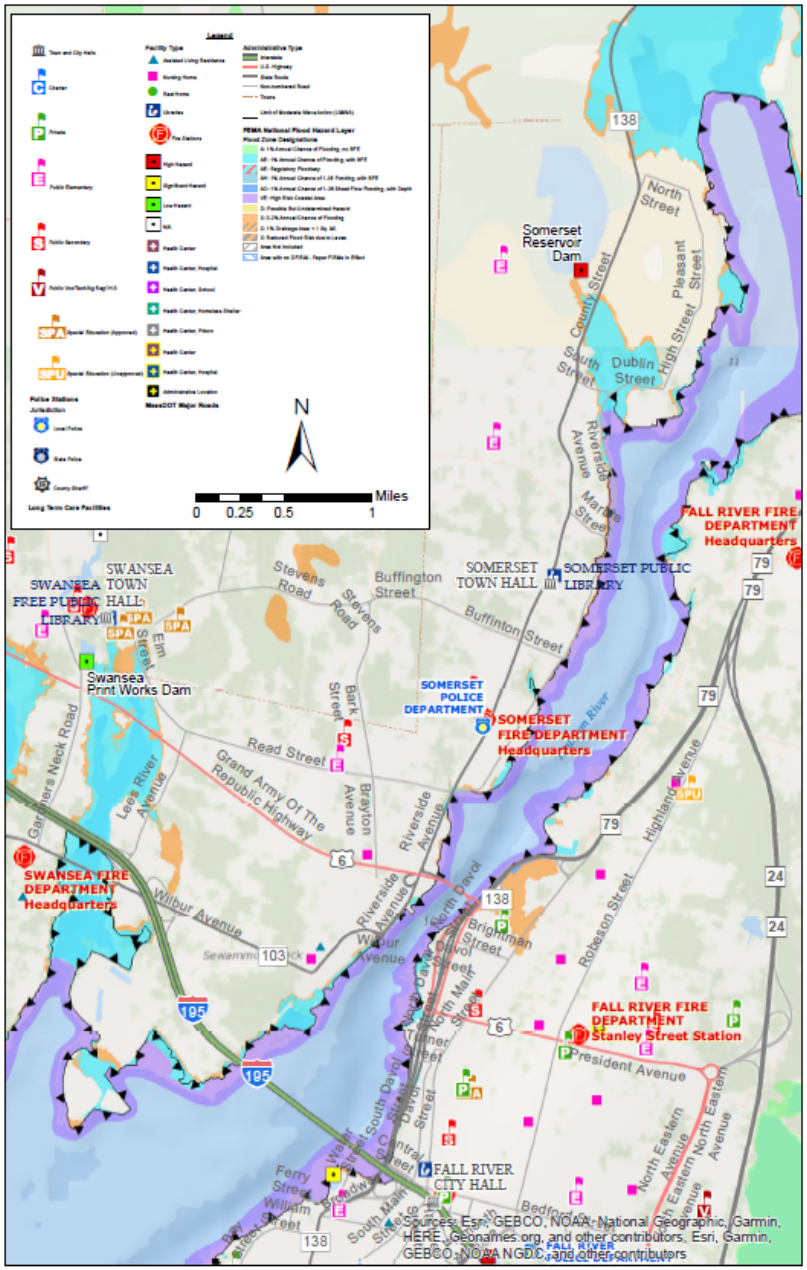
Available Data



Coastal Flooding

Dewberry

Available Data



Coastal Flooding

Dewberry

Resilience Building Workshop

Past, current, and future hazards

- Severe Weather
  - Wind
  - Lightning
  - Hurricanes
  - Nor'easters
  - Hail
  - Tornadoes
  - Flooding (storm surge, SLR, urban drainage)
  - Winter weather (blizzards, ice storms, heavy snowfall)
- Climate
  - Extreme Temperature (extended periods of hot or cold temperatures)
  - Drought
  - Wildfires

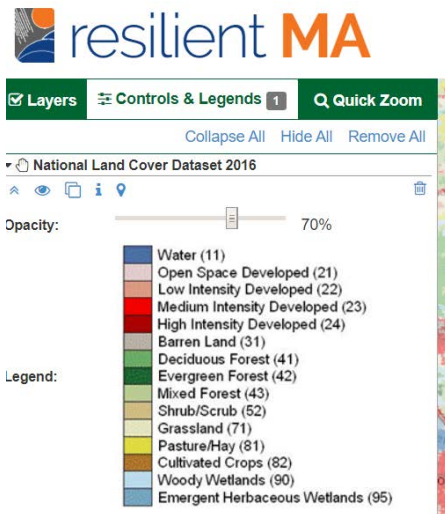
Resilience Building Workshop

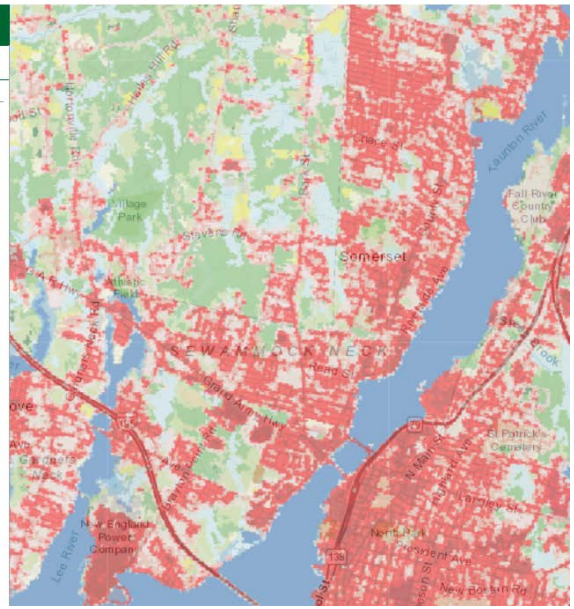
Past, current, and future hazards

Other Hazards:

- Infrastructure-driven but exacerbated by climate change (dam failure, bridge failure, road failure, etc.)
- Public health (e.g. new diseases such as EEE)
- Economic: Loss of valuable economic resources (e.g. loss of fisheries)

Infrastructure (ex. Dams)





Environment

Dewberry

Resilience Building Workshop

Identify past, current, and future hazards

Update on City's Planning Efforts

- Hazard Mitigation Plan – 2018
- Master Plan – 2019
- Economic Development Plan – 2019
- Integrated Water Management Plan – 2018/2019
- Stormwater Management Plan - 2019
- Open Space Plan - 2020

Meet and Greet

Short break

Dewberry

Resilience Building Workshop

Identify past, current, and future hazards

- Bob Bozikowski, Water/Sewer Superintendent
- Scott Jepson, Fire Chief and Emergency Manager
- Tim Turner, Board of Health/Conservation Agent

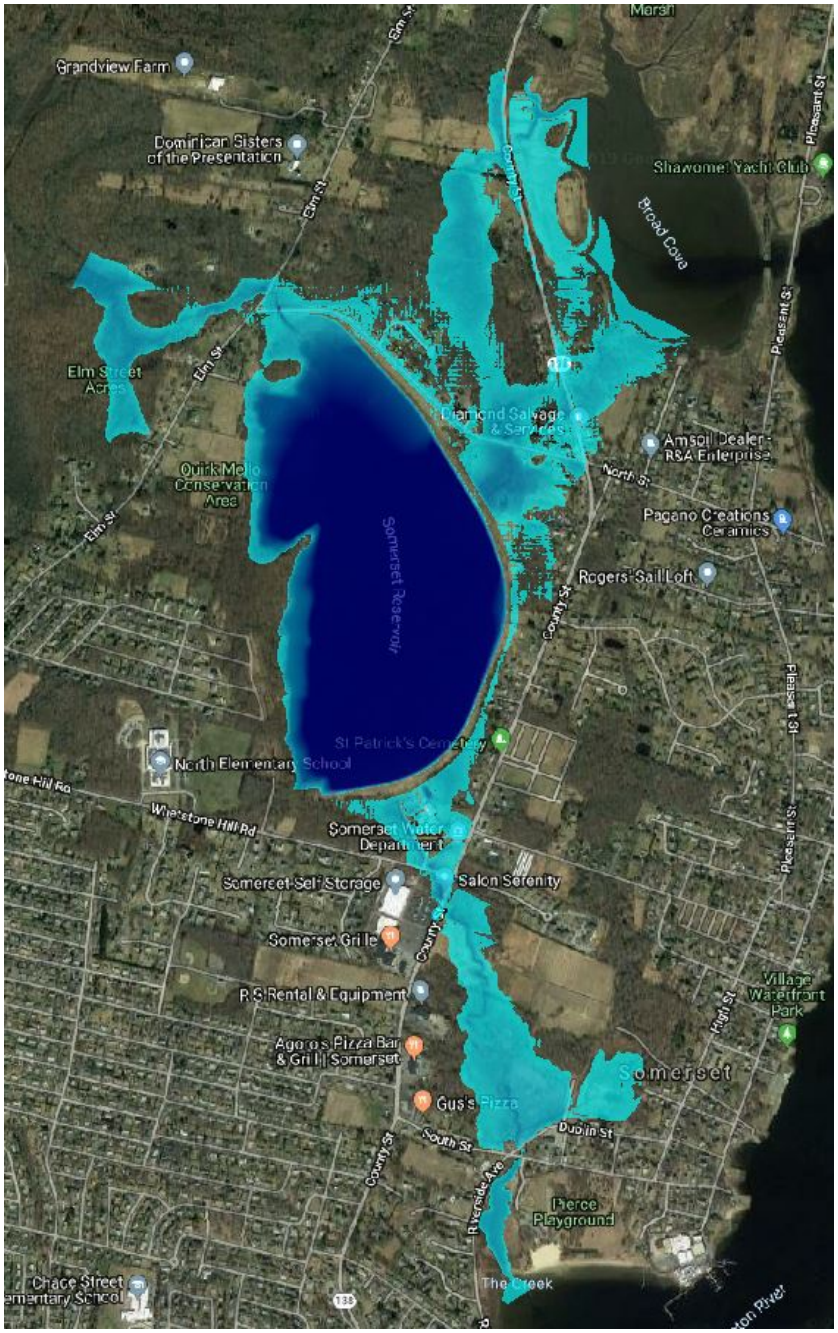


Photo No. 1: Inundation area of existing conditions during the ½ PMF storm event

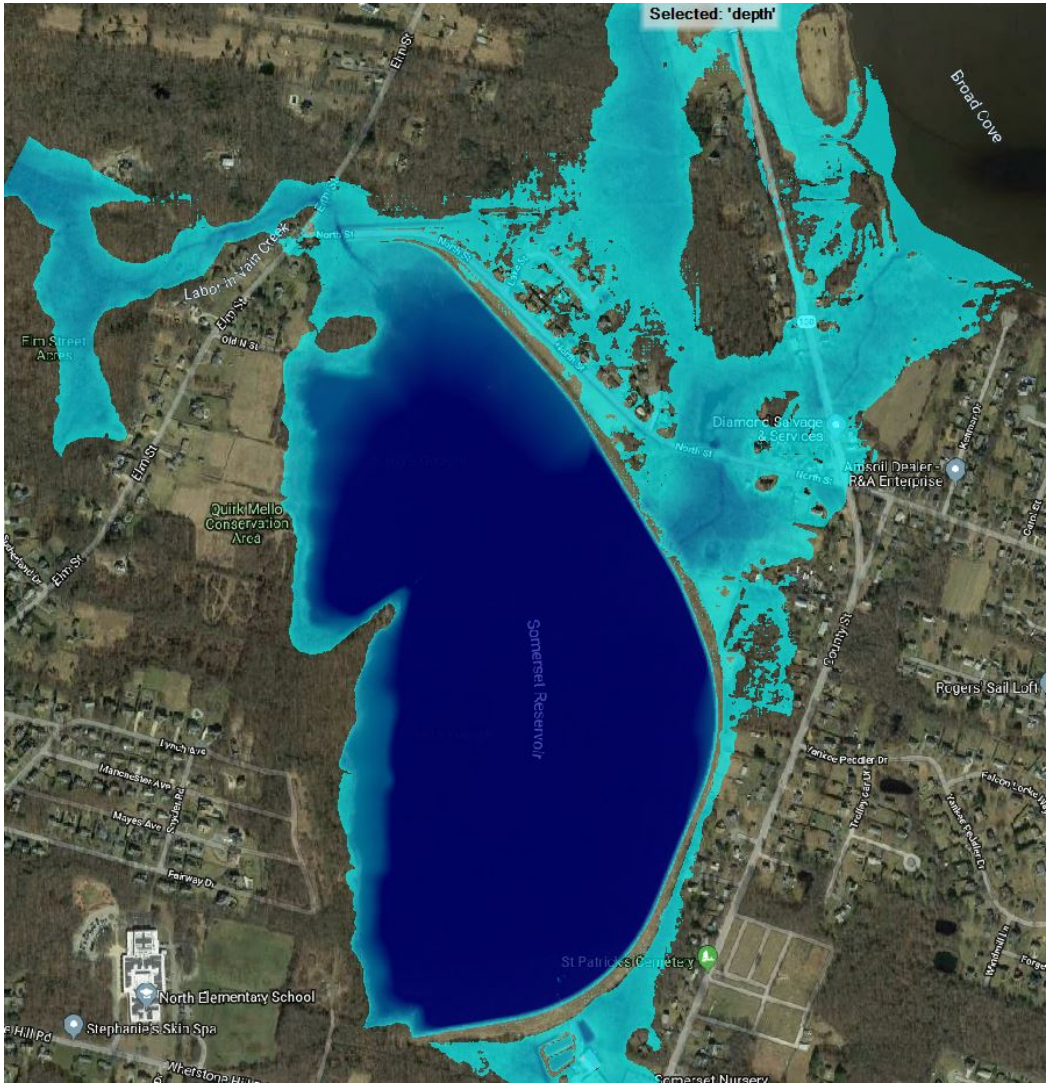


Photo No. 2: Closer view inundation area under existing conditions.

Photo No. 3: Inundation area of proposed alternative #5 during the ½ PMF storm event.

Photo No. 4: Comparison of inundation areas from photos 1 and 3. Yellow outline is inundation area under existing conditions and blue shape is inundation area under proposed alternative #5.

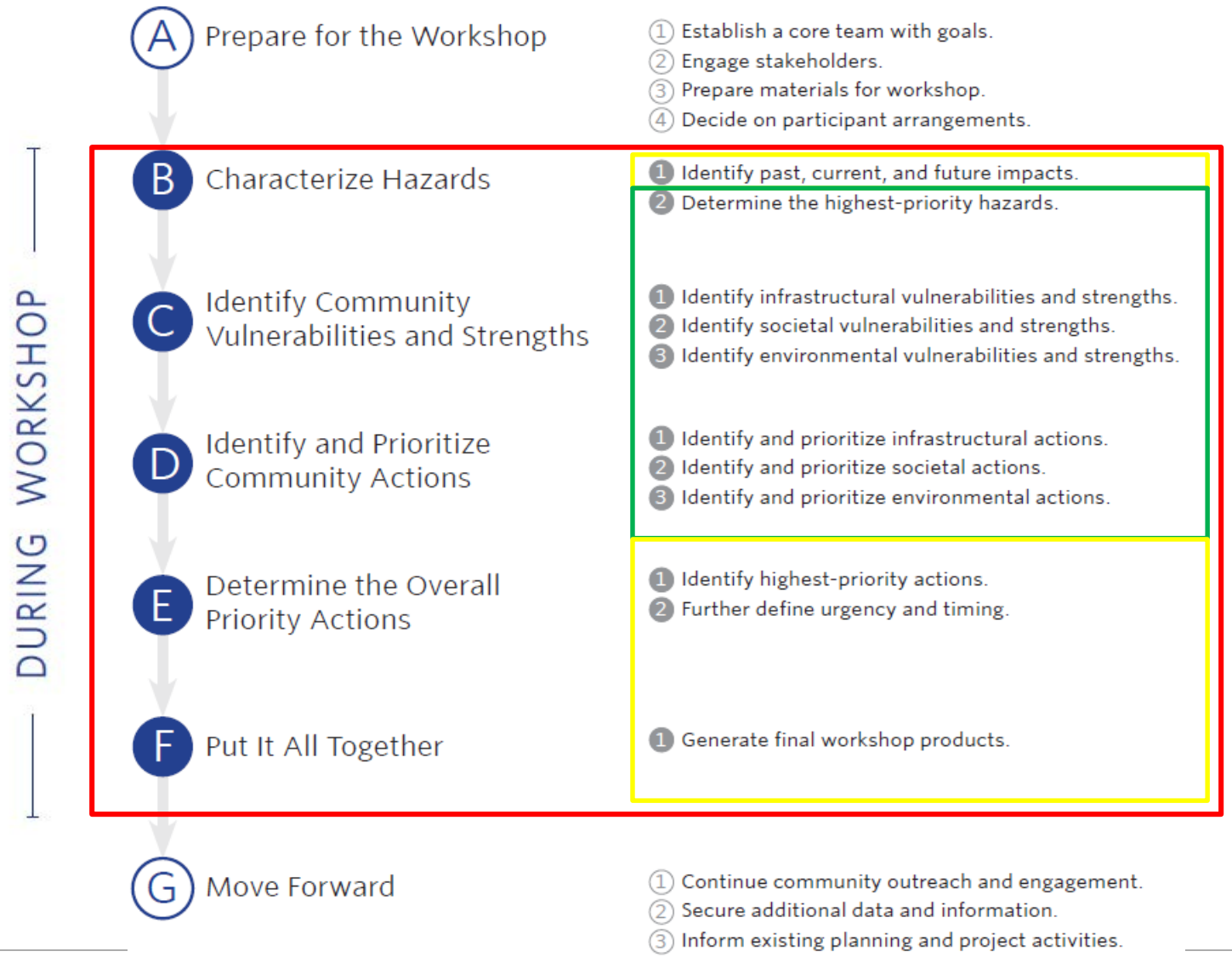
Photo No. 5: Closer view of inundation area of proposed alternative #5.

Whole Group Discussion

Identify Town of Somerset Hazards

Dewberry

Resilience Building Workshop

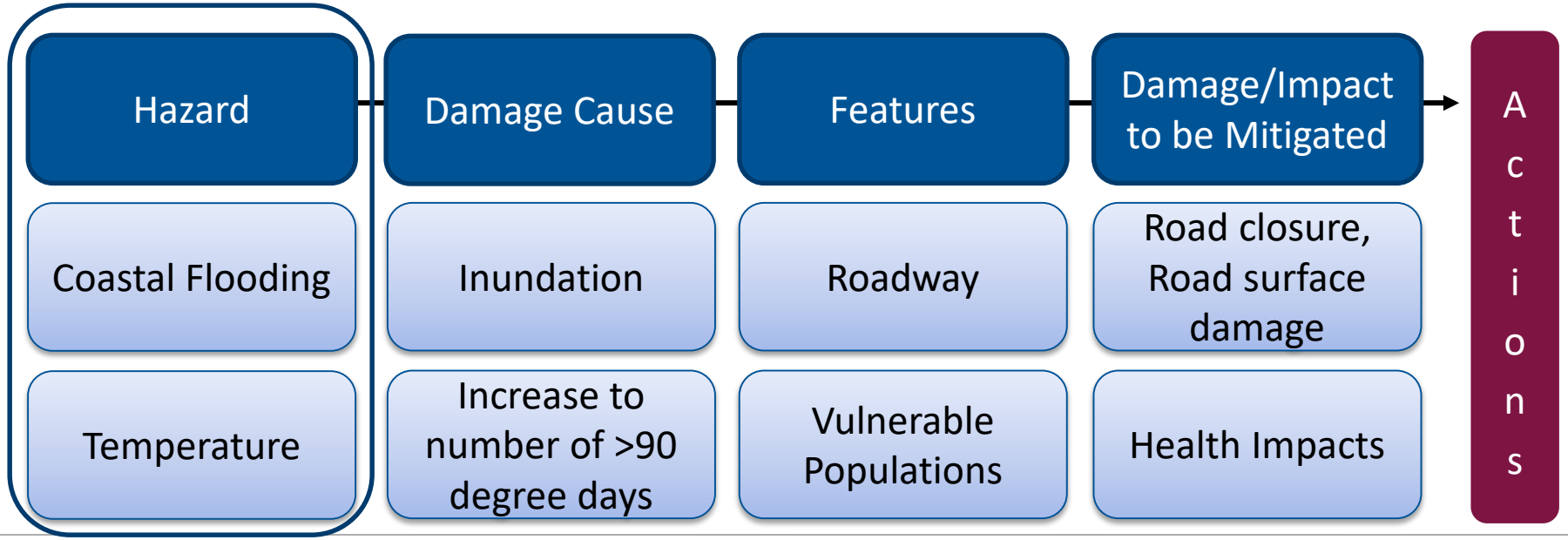


Dewberry

Resilience Building Workshop

Identify Past, Current and Future Hazards

- Identify both past and current hazards and how the evolving climate may exacerbate these.
- Identify potential, new hazards that may appear as a consequence of evolving climate patterns.



Dewberry

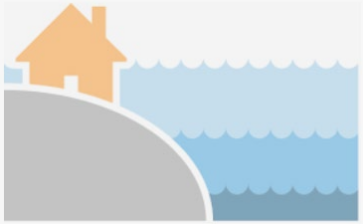
Resilience Building Workshop

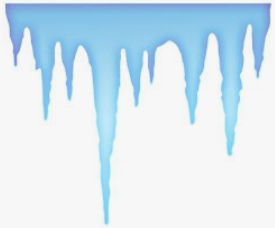
Identify Past, Current and Future Hazards







Dewberry

Break for Dinner

45 Minute Break

Breakout into Small Groups

Dewberry

Resilience Building Workshop

Determine Top Priority Hazards

Small groups to discuss which of the hazards should take priority based on perceived potential damage and frequency (take into account both existing and future weather conditions)

Resilience Building Workshop

Determine Highest Priority Hazards

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					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

Resilience Building Workshop

Identify Strengths and Vulnerabilities

Community Components

Infrastructure Features: It may include schools, roads, bridges, treatment plants, utilities, residential housing, dams, etc.

Triggering Questions:

- What infrastructure/facilities are exposed to current and future hazards? Transportation, waste water treatment, nursing homes, schools, office park, hazardous materials facility, dams, laboratories, churches, pharmacies, groceries, gas stations?
- What makes this infrastructure vulnerable? Location, age, building codes, type of housing?
- What are the consequences of this infrastructure being vulnerable? Lack of access to critical facilities – urgency care/pharmacies?

Resilience Building Workshop

Identify Strengths and Vulnerabilities

Community Components

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.
- Compromised rail system due to heat-related warping of tracks.

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.

Resilience Building Workshop

Identify Strengths and Vulnerabilities

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					Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

Dewberry

Resilience Building Workshop

Identify Strengths and Vulnerabilities

Societal Features: They involve factors and forces that affect the susceptibility of various groups within a community to harm as well as the collective ability to respond and recover from extreme or on-going hazards.

Triggering Questions:

- What are the population characteristics of the people living in high-risk areas? Elderly, low/moderate income, special needs, languages spoken?
- What are the strengths and vulnerabilities of people in your community? Active civic groups, organizations, associations; full-time police, fire, and emergency medical services; strong lines of communication for emergency information?
- How can hazards intensify these characteristics? Where are areas for improvement in the community?

Resilience Building Workshop

Identify Strengths and Vulnerabilities

Community Components

Infrastructural

Societal

Environmental

Examples of Vulnerabilities:

- Senior housing without back-up generators during heat waves.
- Residents without access to transportation during hurricane evacuation.
- Households contaminate and sewage mobilization during flooding.
- Limited areas of refuge in elementary schools during tornados.

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.

Resilience Building Workshop

Identify Strengths and Vulnerabilities

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					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

Resilience Building Workshop

Identify Strengths and Vulnerabilities

Environmental Features: Presence (or lack thereof), increase or reduction in natural elements can affect resilience positively or negatively. For example, wetlands and dunes can protect against coastal flooding, tree canopy can mitigate heat island effect. Construction in flood plains increases vulnerability.

Triggering Questions:

- What natural resources are important to your community?
- What benefits do these natural resources provide (storm buffering, fire breaks, erosion control, water quality improvement, slope stabilization, recreation)?
- Which natural resources are exposed to current and future hazards?
- What have been the effects of these hazards on these natural resources?
- Where are the high-risk areas and what vulnerabilities exist for the environment?

Resilience Building Workshop

Identify Strengths and Vulnerabilities

Examples of Vulnerabilities:

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

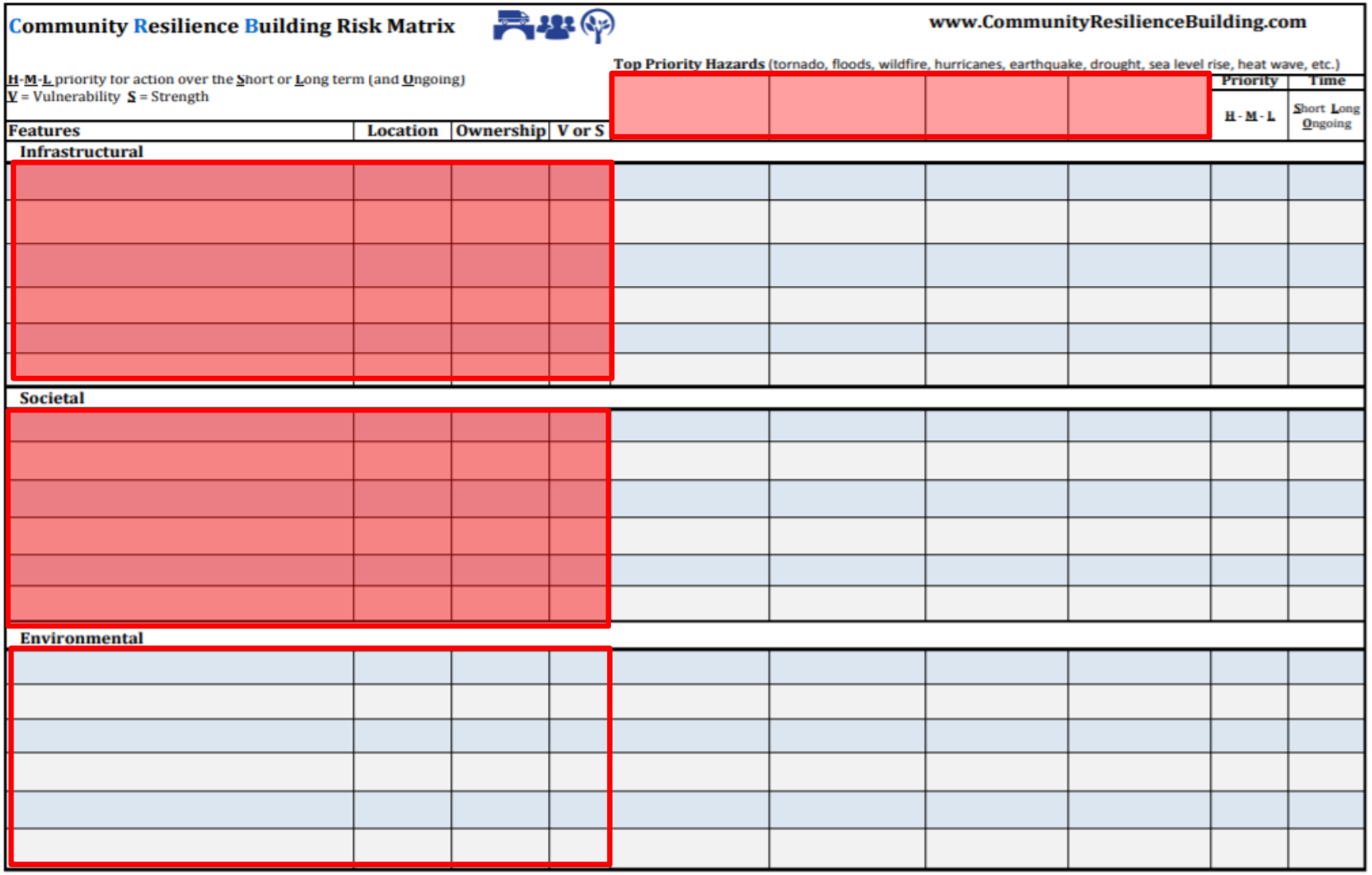
Examples of Strengths:

- 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 24-hour rain events.
- Floodplains provide stormwater storage and downstream flood reduction.

Dewberry

Resilience Building Workshop

Identify Strengths and Vulnerabilities



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					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

Resilience Building Workshop

Identify and Prioritize Community Actions

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H - M - L	Time S Short L Long O Ongoing
Infrastructural									
Town Campus	Specific	Town	V	Verify risk from flooding events; Identify alternative locations during peak flooding; Verify maintenance plan annually				H	S
Evacuation Routes - Roads	Town-wide	Town/State	V	Install highly visible signage for evacuation routes; Develop and implement communication program				H	S
Electrical Distribution System	Multiple	CL&P/Town	V	Within floodplain area, establish plan to address protection and long-term relocation of equipment		Upgrade transformers; Maintain power line protection zone (tree trimming)		H	O-L
Dams (inland and coastal)	Multiple	Private	V	Prevent possibility of catastrophic dam failure; Identify and remove dams to minimize downstream flooding due to failure				H	L
Railway and State Bridges	Multiple	Amtrak/State	V	Improve communications between parties; Expand green/gray infrastructure and improve bridge structures; Assess vulnerability and prioritize infrastructure improvement list				M	S
State Roads/Intersections	Town-wide	State/Town	V	Coordinate with DOT, volunteers, public works to improve response; Need signage to warn of flooding risk in critical intersections				M	L
Wharves and Shore Infrastructure	Shore	Town-State-Private	V	Pursue comprehensive shoreline management plan; Establish community dialogue on retaining/relocating infrastructure				L	S
Waste Water Treatment Facility	Specific	Town	V	Conduct alternative siting feasibility study; Relocate to low risk area within next 25 years.				L	L
New Ambulance Center	Specific	Town	S	Continue to support services in budget; Add additional staff and vehicle in next annual cycle					Ongoing
Zoning Regulations (maintain large lot size)	Multiple	Town	S	Current building codes control development in risky areas; Consider additional zoning incentives (TDRs) to reduce risk to residential units					Ongoing

Dewberry

Resilience Building Workshop

Identify and Prioritize Community Actions

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H - M - L	Time Short Long Ongoing
Societal									
Elderly Citizens (facilities)	Multiple	Private	V	Assess and identify vulnerabilities to determine residents needs during emergencies; Coordinate emergency planning efforts; Conduct routine evacuation drills				H	S
Neighborhood Cooperation	Town-wide	Private	V	Assist associations in identifying and conducting best practices to reduce risk; Advance a "Neighbor helping Neighbor" Program through Community Center training				H	S
Faith-based Organizations	Multiple	Private	V	Coordinate organizations in identifying and conducting best practices amongst members to reduce risk				H	S
Homeless Population	Town-wide	Town	V	Extreme weather flyers and communications about available services				M	S
Vulnerable Neighborhoods	South side	Town/Private	V	Identify level and location of vulnerable units; Develop longer term plan to reduce vulnerability				M	L
Coordinated Evacuation Plan	Town-wide	Town/State	V	Reconfigure evacuation routes; Update signage along critical routes				L	S
Sheltering Facility (upgrades)	Town/Region	Town/State	V	Conduct feasibility analysis for regional sheltering facility; Seek to construct over next 15 years.				L	L
Shelter Management Plan	Town-wide	Town	S	Review and update as needed on annual basis; More resources required (cots, shampoo, etc.)					Ongoing
Lower Household Expenses (flood insurance)	Town-wide	Town	S	Continue enrollment in FEMA Community Rating System (CRS);Reduced number flood insurance rate payers through volunteer buyouts/relocation					Ongoing
Volunteer Fire Department	Town-wide	Town	S	Continue support (well equipped and experienced) to further strengthen services - volunteer outreach					Ongoing

Resilience Building Workshop

Identify and Prioritize Community Actions

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H - M - L	Time Short Long Ongoing
Environmental									
Beaches & Dunes	Multiple	State-Town-Private	V/S	Maintain existing beaches & dunes; Assess values and key locations relative to people and property				H	S
Forest (uniform age structure)	Town-wide	Town/State	V	Seeks management that diversifies the age structure of forests in Town; Assess and identify key vulnerabilities from tree fall				H	S
Salt Marsh	Multiple	State/Private	V/S	Maintain existing marsh; Consider additional regulatory protection (increased setbacks) to prevent impacts to resource; Assess risk reduction potential from existing and future wetlands				H	S
Open Space Acquisition (for flood impact reduction)	Town-wide	Town-State-Private	V	Secure state funding; Salt marsh advancement zones	Secure state/federal funding	Include land protection needs Master Plan		H	S-L
State Parks	Specific	State	V	Encourage the State to work more closely with Town to comprehensively maintain town-wide natural resources, amenities, and water quality; Coordinate with state regarding evacuation procedures				M	S
Rippowam River	Specific	State/Town	V		Improve risk reduction characteristics of waterway through natural infrastructure & riparian buffer enhancements			M	S-L
Drinking Water Reservoir	Multiple	State-Private	V	Conduct assessment to comprehensively identify vulnerabilities and develop action plans to increase resilience of natural resources and long term water quality/quantity; Implement improvements				L	L
Protected Open Space	Multiple	State-Town-Private	S	Maintain existing open space to help reduce risk to Town; Seek to increase open space with the highest risk reduction characteristics					Ongoing
Tree Inventory	Town-wide	Town	S	Continue to utilize tree inventory to develop comprehensive, priority-based tree maintenance plan along transportation/utility corridors					Ongoing
River Restoration Projects	Specific	Town/Private	S	Continue implementation of projects to restore river buffer and remove dam to reduce risk to adjoining homes and businesses					Ongoing

Dewberry

Resilience Building Workshop

Determine Overall Priority Actions

- Objectives of Small Group Discussion
  - Fill out the risk matrix making sure that each category has at least one action.
  - Identify both strengths and vulnerabilities.
  - Identify and prioritize actions.
  - Each group will report out the top 4-5 priority community actions of the group
- The whole group will then create a “short-list” of 3-5 priority actions.

Small Groups

Resilience Building Workshop

Determine Overall Priority Actions

- Team Leaders – present on the identified infrastructure, environmental, and societal vulnerabilities and strengths with prioritized actions (each category should have at least one action) from your group
- Whole group- create a “short-list” of 3-5 priority actions
- Define urgency and timing of the selected priority actions

Closing Remarks

Dewberry

Thank you

Somerset
Nancy Durfee, ndurfee@town.somerset.ma.us

Dewberry
David Bedoya, Dbedoya@Dewberry.com
Kelly Rosofsky, Krosofsky@Dewberry.com
Sarah Hamm, Shamm@Dewberry.com
Scott Choquette, Schoquette@Dewberry.com

Legend

Schools
- Charter
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Surface Water Supply Watersheds
- Surface Water (Active or Inactive)
- Emergency Surface Water

DEP WETLANDS
Resource
- BARRIER BEACH SYSTEM; BARRIER BEACH-COASTAL BEACH
- BOG;CRANBERRY
- COASTAL BANK BLUFF OR SEA CLIFF
- COASTAL BEACH
- COASTAL DUNE
- MARSH
- ROCKY INTERTIDAL SHORE
- SHRUB SWAMP
- TIDAL FLAT
- WOODED SWAMP

Effective FEMA Flood Zones
- A -1% Annual Chance (NO BFE)
- AE -1% Annual Chance (BFE)
- VE -1% Annual Chance w/ Velocity Hazard(BFE)

- Limit of Moderate Wave Action (LiMWA)

0 0.25 0.5 Miles

N

DIGHTON
BERKLEY
SWANSEA
FREETOWN
SOMERSET
FALL RIVER

Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station

SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
FALL RIVER PUBLIC LIBRARY

North Street, County Street, High Street, Dublin Street, South Street, Myrtle Street, Wilbur Avenue, Stevens Road, Buffington Street, Main Street, Elm Street, Bark Street, Read Street, Gardners Neck Road, Lees River Avenue, Grand Army Of The Republic Highway, Braylen Avenue, Riverside Avenue, Taunton River, North Davol Street, North Main Street, Brightman Street, Highland Avenue, Robeson Street, President Avenue, North Eastern Avenue, South Davol Street, Water Street, Central Street, Turner Street

6, 79, 24, 138, 103, 195

Legend

Schools
- Charter
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Surface Water Supply Watersheds
- Surface Water (Active or Inactive)
- Emergency Surface Water

DEP WETLANDS
Resource
- BARRIER BEACH SYSTEM; BARRIER BEACH-COASTAL BEACH
- BOG;CRANBERRY
- COASTAL BANK BLUFF OR SEA CLIFF
- COASTAL BEACH
- COASTAL DUNE
- MARSH
- ROCKY INTERTIDAL SHORE
- SHRUB SWAMP
- TIDAL FLAT
- WOODED SWAMP

0 0.25 0.5 Miles

N

DIGHTON
BERKLEY
SWANSEA
FREETOWN
SOMERSET
FALL RIVER
Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam
SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
FALL RIVER PUBLIC LIBRARY
North Street
County Street
South Street
Dublin Street
High Street
Main Street
Stevens Road
Buffington Street
Elm Street
Bark Street
Gardners Neck Road
Read Street
Grand Army Of The Republic Highway
Braley Avenue
Wilbur Avenue
Riverside Avenue
Taunton River
North Davol Street
South Davol Street
North Main Street
Brightman Street
Robeson Street
President Avenue
Highland Avenue
North Eastern Avenue
Water Street
Central Street
Turner Street
Davol Street
Sharps
Neck
11
15
138
6
79
24
103
195
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Legend

Schools
- Charter
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Surface Water Supply Watersheds
- Surface Water (Active or Inactive)
- Emergency Surface Water

DEP WETLANDS
Resource
- BARRIER BEACH SYSTEM; BARRIER BEACH-COASTAL BEACH
- BOG;CRANBERRY
- COASTAL BANK BLUFF OR SEA CLIFF
- COASTAL BEACH
- COASTAL DUNE
- MARSH
- ROCKY INTERTIDAL SHORE
- SHRUB SWAMP
- TIDAL FLAT
- WOODED SWAMP

NOAA Sea Level Rise (ft)
- NOAA SLR 1ft
- NOAA SLR 10ft

Miles
0 0.25 0.5

N

DIGHTON
BERKLEY
SWANSEA
FREETOWN
SOMERSET
FALL RIVER

Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
FALL RIVER PUBLIC LIBRARY

North Street
County Street
High Street
South Street
Dublin
Main Street
Stevens Road
Buffington Street
Elm Street
Bark Street
Gardners Neck Road
Read Street
Grand Army Of The Republic Highway
Braley Avenue
Lees River Avenue
Wilbur Avenue
Warfield Street
North Davol Street
North Main Street
Brightman Street
Highland Avenue
Robeson Street
Taunton River
President Avenue
North Eastern Avenue
Water Street
Davol Street
Central Street
Turner Street

138 6 79 24 195 103 16

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Legend

Schools

- Schools
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations

- Local Police
- State Police
- County Sheriff

Long Term Care Facilities

- Assisted Living Residence
- Nursing Home
- Rest Home

Dams

- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Sanitary Features

- Pump Station
- Treatment Plant
- Manholes

Mains Diameter (in.)

Unknown, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 21, 24, 27, 30

Effective FEMA Flood Zones

- A -1% Annual Chance (NO BFE)
- AE -1% Annual Chance (BFE)
- VE -1% Annual Chance w/ Velocity Hazard (BFE)
- Limit of Moderate Wave Action (LiMWA)

0 0.25 0.5 Miles

N

DIGHTON

BERKLEY

SWANSEA

FREETOWN

SOMERSET

FALL RIVER

Somerset Reservoir Dam

Montaup #5 Dam

Montaup #3 Dam

Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1

SWANSEA FIRE DEPARTMENT Headquarters

SOMERSET FIRE DEPARTMENT Headquarters

SOMERSET POLICE DEPARTMENT

SOMERSET TOWN HALL

SOMERSET PUBLIC LIBRARY

FALL RIVER FIRE DEPARTMENT Headquarters

FALL RIVER FIRE DEPARTMENT Stanley Street Station

FALL RIVER PUBLIC LIBRARY

North Street, County Street, High Street, South Street, Dublin Street, Stevens Road, Buffington Street, Main Street, Elm Street, Bark Street, Gardners Neck Road, Read Street, Grand Army Of The Republic Highway, Wilbur Avenue, Braley Road, River Avenue, Taunton River, Highland Avenue, North Main Street, North Davol Street, Brightman Street, Robeson Street, President Avenue, North Eastern Avenue, Water Street, Davol Street, Central Street, Turner Street, Marine Street

Routes: 138, 6, 79, 24, 195, 103, 16, 11

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Legend

Schools

- Schools
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations

- Local Police
- State Police
- County Sheriff

Long Term Care Facilities

- Assisted Living Residence
- Nursing Home
- Rest Home

Dams

- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Sanitary Features

- Pump Station
- Treatment Plant
- Manholes

Mains Diameter (in.)

Unknown, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 21, 24, 27, 30

Worst-Case Hurricane Surge Inundation

Category: 1, 2, 3, 4

N

0 0.25 0.5 Miles

DIGHTON

BERKLEY

SWANSEA

FREETOWN

SOMERSET

FALL RIVER

Somerset Reservoir Dam

Montaup #5 Dam

Montaup #3 Dam

Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1

SWANSEA FIRE DEPARTMENT Headquarters

SOMERSET FIRE DEPARTMENT Headquarters

SOMERSET POLICE DEPARTMENT

SOMERSET TOWN HALL

SOMERSET PUBLIC LIBRARY

FALL RIVER FIRE DEPARTMENT Headquarters

FALL RIVER FIRE DEPARTMENT Stanley Street Station

FALL RIVER PUBLIC LIBRARY

North Street, Dublin Street, South Street, Commercial Street, Hortonia Street, Stevens Road, Buffington Street, Main Street, Elm Street, Bark Street, Read Street, Grand Army Of The Republic Highway, Braley Avenue, River Avenue, Gardners Neck Road, Wilbur Avenue, North Davol Street, North Main Street, Brightman Street, Taunton River, Highland Avenue, Robeson Street, President Avenue, North Eastern Avenue, Water Street, Central Street, Turner Street, Davol Street, South Main Street

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Legend

Schools
- Schools
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Sanitary Features
- Pump Station
- Treatment Plant
- Manholes

Mains Diameter (in.)
- Unknown
- 4
- 5
- 6
- 8
- 10
- 12
- 14
- 15
- 16
- 18
- 21
- 24
- 27
- 30

NOAA Sea Level Rise (ft)
- NOAA SLR 1ft
- NOAA SLR 10ft

N

0 0.25 0.5 Miles

DIGHTON
BERKLEY
SWANSEA
SOMERSET
FREETOWN
FALL RIVER
Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam
SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
FALL RIVER PUBLIC LIBRARY
Taunton River
Main Street
Stevens Road
Buffington Street
Elm Street
Bark Street
Gardners Neck Road
Read Street
Grand Army Of The Republic Highway
Wilbur Avenue
North Main Street
North Davol Street
Brightman Street
Robeson Street
President Avenue
Highland Avenue
Water Street
Central Street
Turner Street
Dover Street
North Eastern Avenue
Dublin
South Street
County Street
High Street
Marlboro Street
Braylton Avenue
River Avenue
Buffinton Street
138
6
79
24
195
103
WTP

Legend

Schools
- Schools
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Building Type
- Abandoned or Vacant
- Agricultural
- Multi-Family Homes/Apartments/Dwellings
- Auditorium; Town Hall
- Burial Ground;
- Business Offices/Hospital
- Chapel/School
- Fire House/Parking/Maintenance
- Industrial and Utilities
- Retail Multi
- Hotel or Inn
- Library
- Lighthouse
- Meeting Hall
- Military Other
- OTHER/Educational
- Park
- Rectory

Zone Type
- Business
- Industrial
- Limitited Business
- Light Industrial
- Open recreational
- PARK
- Residence

Effective FEMA Flood Zones
- A -1% Annual Chance (NO BFE)
- AE -1% Annual Chance (BFE)
- VE -1% Annual Chance w/ Velocity Hazard (BFE)
- Limit of Moderate Wave Action (LiMWA)

0 0.25 0.5 Miles

N

DIGHTON
BERKLEY
SWANSEA
SOMERSET
FALL RIVER
FREETOWN

Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
FALL RIVER PUBLIC LIBRARY

North Street
County Street
South Street
Dublin Street
Sharps Lot Road
Stevens Road
Buffington Street
Main Street
Elm Street
Bark Street
Gardners Neck Road
Read Street
Grand Army Of The Republic Highway
Wilbur Avenue
Brayton Avenue
Taunton River
North Davol Street
North Main Street
Brightman Street
Highland Avenue
Robeson Street
President Avenue
North Eastern Avenue
Water Street
Central Street
Turner Street
Davol Street
South Main Street

138 79 6 24 195 103

Legend

Schools
- Schools
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Building Type
- Abandoned or Vacant
- Agricultural
- Multi-Family Homes/Apartments/Dwellings
- Auditorium; Town Hall
- Burial Ground;
- Business Offices/Hospital
- Chapel/School
- Fire House/Parking/Maintenance
- Industrial and Utilities
- Retail Multi
- Hotel or Inn
- Library
- Lighthouse
- Meeting Hall
- Military Other
- OTHER/Educational
- Park
- Rectory

Zone Type
- Business
- Industrial
- Limitited Business
- Light Industrial
- Open recreational
- PARK
- Residence

Worst-Case Hurricane Surge Inundation Category
- 1
- 2
- 3
- 4

Miles
0 0.25 0.5

N

DIGHTON
BERKLEY
SWANSEA
FREETOWN
SOMERSET
FALL RIVER

Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
FALL RIVER PUBLIC LIBRARY

North Street
South Street
Dublin Street
County Street
Wilbur Avenue
Stevens Road
Buffington Street
Main Street
Elm Street
Bark Street
Gardners Neck Road
Read Street
Grand Army Of The Republic Highway
Bay View Avenue
River Avenue
Taunton River
North Davol Street
North Main Street
Brightman Street
Highland Avenue
Robeson Street
President Avenue
North Eastern Avenue
Water Street
Central Street
Turner Street

138 6 79 24 103 195

Legend

Schools
- Schools
- Private
- Public Elementary
- Public Secondary
- Public Voc/Tech/Ag Reg'l HS
- Special Education (Approved)
- Special Education (Unapproved)

Police Stations
- Local Police
- State Police
- County Sheriff

Long Term Care Facilities
- Assisted Living Residence
- Nursing Home
- Rest Home

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- Town and City Halls
- Libraries
- Fire Stations
- Building Footprints

Building Type
- Abandoned or Vacant
- Agricultural
- Multi-Family Homes/Apartments/Dwellings
- Auditorium; Town Hall
- Burial Ground;
- Business Offices/Hospital
- Chapel/School
- Fire House/Parking/Maintenance
- Industrial and Utilities
- Retail Multi
- Hotel or Inn
- Library
- Lighthouse
- Meeting Hall
- Military Other
- OTHER/Educational
- Park
- Rectory

Zone Type
- Business
- Industrial
- Limitited Business
- Light Industrial
- Open recreational
- PARK
- Residence

NOAA Sea Level Rise (ft)
- NOAA SLR 1ft
- NOAA SLR 10ft

Miles
0 0.25 0.5

N

DIGHTON
BERKLEY
SWANSEA
FREETOWN
SOMERSET
FALL RIVER

Somerset Reservoir Dam
Montaup #5 Dam
Montaup #3 Dam
Swansea Print Works Dam

SWANSEA FIRE DEPARTMENT Station 1
SWANSEA FIRE DEPARTMENT Headquarters
SOMERSET FIRE DEPARTMENT Headquarters
SOMERSET POLICE DEPARTMENT
SOMERSET TOWN HALL
SOMERSET PUBLIC LIBRARY
FALL RIVER FIRE DEPARTMENT Headquarters
FALL RIVER FIRE DEPARTMENT Stanley Street Station
FALL RIVER PUBLIC LIBRARY

North Street
County Street
South Street
Dublin Street
Buffington Street
Stevens Road
Main Street
Elm Street
Bark Street
Gardners Neck Road
Read Street
Grand Army Of The Republic Highway
Wilbur Avenue
Brayton Avenue
Riverside Avenue
Taunton River
North Davol Street
North Main Street
Brightman Street
Highland Avenue
Robeson Street
President Avenue
North Eastern Avenue
Water Street
Central Street
Turner Street

138
6
79
24
103
195

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Town Campus	Specific	Town	V	Verify risk from flooding events; Identify alternative locations during peak flooding; Verify maintenance plan annually				H	S
Evacuation Routes - Roads	Town-wide	Town/State	V	Install highly visible signage for evacuation routes; Develop and implement communication program				H	S
Electrical Distribution System	Multiple	CL&P/Town	V	Within floodplain area, establish plan to address protection and long-term relocation of equipment		Upgrade transformers; Maintain power line protection zone (tree trimming)		H	O-L
Dams (inland and coastal)	Multiple	Private	V	Prevent possibility of catastrophic dam failure; Identify and remove dams to minimize downstream flooding due to failure				H	L
Railway and State Bridges	Multiple	Amtrak/State	V	Improve communications between parties; Expand green/gray infrastructure and improve bridge structures; Assess vulnerability and prioritize infrastructure improvement list				M	S
State Roads/Intersections	Town-wide	State/Town	V	Coordinate with DOT, volunteers, public works to improve response; Need signage to warn of flooding risk in critical intersections				M	L
Wharves and Shore Infrastructure	Shore	Town-State-Private	V	Pursue comprehensive shoreline management plan; Establish community dialogue on retaining/relocating infrastructure				L	S
Waste Water Treatment Facility	Specific	Town	V	Conduct alternative siting feasibility study; Relocate to low risk area within next 25 years.				L	L
New Ambulance Center	Specific	Town	S	Continue to support services in budget; Add additional staff and vehicle in next annual cycle					Ongoing
Zoning Regulations (maintain large lot size)	Multiple	Town	S	Current building codes control development in risky areas; Consider additional zoning incentives (TDRs) to reduce risk to residential units					Ongoing

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H - M - L	Time Short Long Ongoing
Societal									
Elderly Citizens (facilities)	Multiple	Private	V	Assess and identify vulnerabilities to determine residents needs during emergencies; Coordinate emergency planning efforts; Conduct routine evacuation drills				H	S
Neighborhood Cooperation	Town-wide	Private	V	Assist associations in identifying and conducting best practices to reduce risk; Advance a "Neighbor helping Neighbor" Program through Community Center training				H	S
Faith-based Organizations	Multiple	Private	V	Coordinate organizations in identifying and conducting best practices amongst members to reduce risk				H	S
Homeless Population	Town-wide	Town	V	Extreme weather flyers and communications about available services				M	S
Vulnerable Neighborhoods	South side	Town/Private	V	Identify level and location of vulnerable units; Develop longer term plan to reduce vulnerability				M	L
Coordinated Evacuation Plan	Town-wide	Town/State	V	Reconfigure evacuation routes; Update signage along critical routes				L	S
Sheltering Facility (upgrades)	Town/Region	Town/State	V	Conduct feasibility analysis for regional sheltering facility; Seek to construct over next 15 years.				L	L
Shelter Management Plan	Town-wide	Town	S	Review and update as needed on annual basis; More resources required (cots, shampoo, etc.)					Ongoing
Lower Household Expenses (flood insurance)	Town-wide	Town	S	Continue enrollment in FEMA Community Rating System (CRS);Reduced number flood insurance rate payers through volunteer buyouts/relocation					Ongoing
Volunteer Fire Department	Town-wide	Town	S	Continue support (well equipped and experienced) to further strengthen services - volunteer outreach					Ongoing

Community Resilience Building Workshop Risk Matrix

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

Top 4 Hazards (tornado, floods, wildfire, hurricanes, snow/ice, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Coastal Flooding SLR/Storm Surge	Inland Flooding and Rain Events	Ice and Snow	Wind	Priority H - M - L	Time Short Long Ongoing
Environmental									
Beaches & Dunes	Multiple	State-Town-Private	**V/S**	Maintain existing beaches & dunes; Assess values and key locations relative to people and property				**H**	**S**
Forest (uniform age structure)	Town-wide	Town/State	**V**	Seeks management that diversifies the age structure of forests in Town; Assess and identify key vulnerabilities from tree fall				**H**	**S**
Salt Marsh	Multiple	State/Private	**V/S**	Maintain existing marsh; Consider additional regulatory protection (increased setbacks) to prevent impacts to resource; Assess risk reduction potential from existing and future wetlands				**H**	**S**
Open Space Acquisition (for flood impact reduction)	Town-wide	Town-State-Private	**V**	Secure state funding; Salt marsh advancement zones	Secure state/federal funding	Include land protection needs Master Plan		**H**	**S-L**
State Parks	Specific	State	**V**	Encourage the State to work more closely with Town to comprehensively maintain town-wide natural resources, amenities, and water quality; Coordinate with state regarding evacuation procedures				**M**	**S**
Rippowam River	Specific	State/Town	**V**		Improve risk reduction characteristics of waterway through natural infrastructure & riparian buffer enhancements			**M**	**S-L**
Drinking Water Reservoir	Multiple	State-Private	**V**	Conduct assessment to comprehensively identify vulnerabilities and develop action plans to increase resilience of natural resources and long term water quality/quantity; Implement improvements				**L**	**L**
Protected Open Space	Multiple	State-Town-Private	**S**	Maintain existing open space to help reduce risk to Town; Seek to increase open space with the highest risk reduction characteristics					**Ongoing**
Tree Inventory	Town-wide	Town	**S**	Continue to utilize tree inventory to develop comprehensive, priority-based tree maintenance plan along transportation/utility corridors					**Ongoing**
River Restoration Projects	Specific	Town/Private	**S**	Continue implementation of projects to restore river buffer and remove dam to reduce risk to adjoining homes and businesses					**Ongoing**

Appendix VII

Public Hearing Sign-In Sheet

MUP Plan 12.16-2019

Name:	Address:
Arnold + Pat Bamford	2785 Riverside Ave, Som.
Bob Bozikowski	rbozikowski@gmail.com
David Bedoya	dbedoya@dewberry.com
Tim Turner	TTurner@Town.Somerset.ma.us
Ron Cogliox	RANCOGLEY@ME.COM
Denise M Jordan	denisemjordan@Mac.com

Regional Projects Addendum to the

Somerset-Swansea-Dighton

MVP Plans

October
2020

Resilient Taunton Watershed Network

SOMERSET-SWANSEA-DIGHTON MVP PLAN/REGIONAL ADDENDUM SUPPLEMENTAL SCOPE

Task 1. Convene and conduct a Regional MVP Workshop

On October 15 and 21, 2020, a regional MVP meeting/workshop was convened by the local Core Team (Somerset), with the Provider, and partnering towns (Swansea and Dighton) to review the recommendations in their individual plans that involve regional assets and afford opportunity for cooperative, inter-municipal approaches to addressing environmental, infrastructural, and societal vulnerabilities, as well as to look at new opportunities resulting from this regional meeting. The meeting was socially distanced, and hosted by the Town of Dighton in the large meeting room of the Old Dighton Town Hall.

It was mutually agreed upon that the local Core Team Leaders (Nancy Durfee, Somerset; Nancy Goulart, Dighton; Colleen Brown, Swansea) would solicit input from their respective Core Teams, and bring that information to the regional meetings. All information was recorded on the standard MVP/CRB matrices, and all potential projects were located on a draft regional map.

Task 2. Set of MVP Regional Maps and GIS files for the Towns of Somerset, Swansea, and Dighton

A final set of hazard/vulnerability/potential regional project maps will be developed, from the activities undertaken in Task 1, and reviewed with the participating town representatives and their Core Teams. An approved final map is included in the addendum, and along with the narrative, will become part of the MVP Plans for each of the participating towns. GIS files will be made available to the Towns for integration into their other community plans.

Task 3. Assess and summarize vulnerabilities/projects matrices and prepare a regional addendum for the participating community MVP Plans

As stated above, the approved list of identified regional vulnerabilities/potential projects identified in Task 1 will appear in a final list of recommendations for the regional addendum.

Task 4. Aid the towns in submitting the Somerset/Swansea/Dighton regional addendum to EEA.

The approved final addendum maps and regional plan will be completed and the plan will be submitted to EEA MVP Regional Coordinator for final review.

SOMERSET/SWANSEA/DIGHTON REGIONAL VULNERABILITY CONCERNS

INFRASTRUCTURE (Red Dots on the Regional Map)

1. Feasibility study for the Somerset Reservoir Dam and associated infrastructure, **and 3.,** the culverts on North Street and Elm Street in Somerset, in relation to regional flood impact **(HIGH PRIORITY) ***

2. Acquire the Warren Reservoir in Swansea in order to enhance regional water supply assets

4. Feasibility study of the Muddy Cove Pond dam and land off of Elm St., at Sally Richmond Brook, as part of a regional flood, recreational, and water assets strategy

5 – 13. Assess the following bridges and culverts for flood hazard remediation with sea level rise and tidal surge:

5. Route 103 bridge over the Lees River
6. Culvert on Route 6 at the near the Venus de Milo
7. Pleasant Street at Muddy Cove **(HIGH PRIORITY) ***
8. Interstate Route 195 bridge near Ocean Blvd. and Halsey Rd.
9. Briggs Street Bridge
10. Center Bridge at Middle Street
11. Baker Rd. culvert on the Coles River **(HIGH PRIORITY) ***
12. Locust St. culvert
13. Route 138, Elm Street, Whetstone Hill/and around the reservoir **(HIGH PRIORITY) ***

ENVIRONMENTAL (Green Dots on the Regional Map)

1. Increase the land holdings around, and saltmarsh protection and remediation in, Broad Cove*****

2. Conduct a Phase 2 study on the landfill off of Hart St.

3. Increase the holdings off of Sharp's Lot Rd., north of Marvel St., and in Dighton, in order to protect the headwaters of the Coles River*****

4. Increase holdings off of Cedar St. to protect the Dighton water supply*****

5. Increase holdings in Dighton and Somerset in the Elm St. area of the Labor-in-Vain Brook watershed*****

(COLLECTIVELY, ACTIONS 1, 3, 4, and 5 are HIGH PRIORITY)

6. Feasibility study of the Muddy Cove Pond dam and land off of Elm Street, at Sally Richmond Brook, as part of a regional flood storage, recreational opportunity, and water assets strategy

7. Assess our shared watershed and sub-watershed resilience capacity*****

8. Assess the role of our green infrastructure and open space in terms of long-range resiliency planning*****

9. Protect land and flood storage capacity in the headwaters of the Segregansett River (this would also involve Taunton) *****

(COLLECTIVELY, ACTIONS 7, 8, and 9 are HIGH PRIORITY)

SOCIETAL (Blue Dots on the Regional Map)

1. Encourage more inter-municipal communication prior to and during emergencies (create a regional plan/team, if necessary, and involve Fall River for water issues)

2. Create Debris Management Plans (individual and regional) **(HIGH PRIORITY) ***

3. Assessment of our emergency response needs for equipment and generators/mutual aid

4. Assessment of our ability to handle and dispose of hazardous materials in times of emergency/social vulnerability; associated planning and training needs

5. Create a flow chart for regional emergency response for Town Hall use (aggregate as appropriate) **(HIGH PRIORITY) ***

6. Regional educational materials on flooding, stormwater, and MS4 issues; develop a story map similar to the EPA-Mattapoisett model **(HIGH PRIORITY) ***

7. Highlight evacuation routes as part of our educational package

8. Assess regional sheltering capacity (short and long-term)

Somerset,Dighton,Swansea Regional MVP Map

Legend

FEMA National Flood Hazard Layer
Flood Zone Designations

- A: 1% Annual Chance of Flooding, no BFE
- AE: 1% Annual Chance of Flooding, with BFE
- AE: Regulatory Floodway
- AH: 1% Annual Chance of 1-3ft Ponding, with BFE
- AO: 1% Annual Chance of 1-3ft Sheet Flow Flooding, with Depth
- VE: High Risk Coastal Area
- D: Possible But Undetermined Hazard
- X: 0.2% Annual Chance of Flooding
- X: Reduced Flood Risk due to Levee
- Area Not Included
- Area with no DFIRM - Paper FIRMs in Effect

- Green Infrastructure Network (unprotected)
- Green Infrastructure Network (protected)
- Open Water

- ENVIRONMENTAL
- INFRASTRUCTURAL
- SOsocietal

- Fire Stations
- Local Police
- State Police
- Libraries
- Town Halls
- Seasonal Farmers Market
- Assisted Living Residence
- Nursing Home

Schools

- Public
- Private
- Collaborative Program
- Special Education

ATTLEBORO FIRE DEPARTMENT
Twin Village Station
REHOBOTH FIRE DEPARTMENT
Station 2
TAUNTON FIRE DEPARTMENT
Oakland Station
Rehoboth Town Hall
DIGHTON FIRE DEPARTMENT
Station 2
REHOBOTH FIRE DEPARTMENT
Headquarters
Rehoboth
Dighton Care and Rehabilitation Center LLC
Dighton Town Hall
SEEKONK POLICE
Warren Upper Reservior
Muddy Cove Pond
REHOBOTH FIRE DEPARTMENT
Station 3
Broad Cove
Somerset Reservoir
Warren Reservior
Cole River Pond
Country Gardens Health & Rehabilitation Center
Taunton River
Sarah Brayton Nursing Care Center
SWANSEA FIRE DEPARTMENT
Fire Dept. 4
Milford Pond
Somerset Town Hall
SWANSEA FIRE DEPARTMENT
Station 1
SWANSEA POLICE DEPT
SOMERSET POLICE DEPT
SOMERSET FIRE DEPARTMENT
Headquarters
Lee River
Catholic Memorial Home
Somerset Ridge Center
Highlander Nursing and Rehabilitation
SWANSEA FIRE DEPARTMENT
Station 3
Clifton Assisted Living Community
Clifton Rehabilitation Nursing Center
Adams House
Highland Manor Care and Rehabilitation Center LLC
FALL RIVER FIRE DEPARTMENT
Stanley Street Station
Kimwell Nursing and Rehabilitation
Fall River Jewish Home, Inc.
Fall River / Ruggles Park
Crawford Skilled Nursing and Rehabilitation Center
Fall River City Hall
Fall River / Kennedy Park
Landmark at Fall River
Fall River/Downtown
FALL RIVER CITY POLICE DEPT

7 8 9 POLICY ITEMS REFER TO TEXT

1 2 3 4 5 6 7 8 POLICY ITEMS REFER TO TEXT

1 mile