CITY OF MILFORD

SCRCOG HAZARD MITIGATION PLAN UPDATE ANNEX

JANUARY 2023

City of Milford

70 West River Street

Milford, Connecticut 06460

https://www.ci.milford.ct.us

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Milford Annex
2023 SCRCOG Mitigation Plan Update

This municipality Annex includes details regarding Milford not included in the main body of the 2023 SCRCOG Mitigation Plan Update. The municipality annexes were developed to assist municipalities with the process of implementing and maintaining their portion of the 2023 SCRCOG Mitigation Plan Update. The Annex includes a Municipality Profile, Risk Analysis, Capability Assessment, and Mitigation Actions.

Municipality Profile

Milford, is the 6th oldest town in Connecticut, purchased in 1639 from the Paugussett Tribe though it is now recognized as a City.[1] The City's proximity to Long Island Sound made it primarily a shipbuilding, trade, and small industrial town that later developed a steady leather industry. Today, Milford has a small-town feel, with a strong historical presence, and an economy that supports "manufacturing, retail, corporate office, and service industry."[2] The jurisdiction hosts the second longest "town green" in New England, containing multiple memorials. The Borough of Woodmont and the Village of Devon are encompassed within the jurisdiction. Milford's government is set up in the format of a Mayor and Board of Aldermen.[3]

1.1 Demographics

Milford has a current population of 54,328 people. There are 24,417 housing units in Milford, 68.5% of which are owner-occupied, 23.5% are renter-occupied, and 8.1% are vacant. The unemployment rate is at 3.4% which is a significant decrease from a peak of 9.2% in 2010. As of 2019, 4.8% of the population lives below the poverty level and 30,716 people are in the annual labor force. In Milford, 43% of residents have a bachelor's degree or higher, which is up by 13.7% since 2000. The median household income is $91,799.[4]

As for the community make-up of the City, 85.3% of residents identified as White, 3.3% identified as Black or African American, 0.1% identified as American Indian and Alaska Native, 6.9% identified as Asian, 3.0% identified as Two or More Races, and 6.0% identified as Hispanic or Latino. Of Milford's population, 11.9% were foreign-born persons.[5]

[1] "Milford History." City of Milford Connecticut.

[2] "About the City of Milford." City of Milford Connecticut.

[3] "Mayor's Office." City of Milford Connecticut.

[4] "South Central Region, CT: Demographic & Socioeconomic Trends." (2021). South Central Regional Council of Governments.

[5] "QuickFacts Milford City (balance), Connecticut." (2022). United States Census Bureau.

1.2 Geography and Water

Milford lies in the southwest corner of the planning region, with 17 miles of Long Island Sound coastline. The City is surrounded and intersected by bodies of water. The Wepawaug River runs through the City's center and ends in Milford Harbor which is in the southeastern portion of the jurisdiction. Indian River also runs to the east of the City, leading to Indian Lake in the north. Calf Pen Creek and the Farley Brook/Oyster River systems also bisect Milford in the east.[6] Additionally, the City contains several parks, notably Silver Sands State Park on the coast and Eisenhower Park along the Wepawaug River. Milford is bordered in the west by the Housatonic River, and to the east by West Haven.

1.3 Transportation

The City of Milford is located near major transportation corridors. Interstate 95, Interstate Route 15 (Wilbur Cross Parkway), and U.S Route 1 traverse Milford from west to east. The Metro North Railroad service has a stop in historic downtown Milford which provides east-west and north-south access through Amtrak and the Shoreline East Network in New Haven.[7] Long Island residents can cross Long Island Sound to Milford Lisman Landing Marina by boat.

The City can be reached by highway, parkway, or rail which connects it to the greater New York Metropolitan area and other areas of New England. The amount of bus connectivity has also contributed to its successful role as a regionally serviced commercial corridor. Locally, there is an extensive roadway network; however, the City believes there is more work to be done for multi-modal transit specifically with bikeability and walkability.

As a means of transportation in 2019, 82.4% of Milford residents drove alone, 5.9% carpooled, while only 4.5% used public transportation. Approximately 71.1% of the population commutes to a different municipality for work, which is a slight decrease from 74.1% in 2000.[8]

The City also has the Milford Greenway System which runs through the Wepawaug, Beaverbrook and Housatonic, Indian River Stubby Plan, and Farley Brook/Crystal River corridors and protects the significant waterways throughout the City.[9]

[6] "Milford 2012-2022 Plan of Conservation and Development." (2012). Milford, Connecticut.

[7] "Milford 2012-2022 Plan of Conservation and Development." (2012). Milford, Connecticut.

[8] "South Central Region, CT: Demographic & Socioeconomic Trends." (2021). South Central Regional Council of Governments.

[9] "South Central CT Region Plan of Conservation & Development." (2018). South Central Regional Council of Governments. Pg. 31.

1.4 Land Use and Development

Milford hosts a vibrant retail and residential community, with a focus on coastal development and preserving historically significant sites. In the South Central Region Plan of Conservation and Development 2018-2028, Milford's goals include, "preserving open space, promoting commercial corridors and infrastructure improvements including transportation networks, and encouraging Transit Oriented Development (TOD) and planning for climate change."[10] Milford has the lowest tree canopy in the region at just over 40% existing tree canopy.[11] Because of Milford's extensive waterways, the area is susceptible to flood damage and storm surges. Under the Regional Framework for Coastal Resilience in Southern CT, Milford plans to complete several beach nourishment projects, repairing banks and breakwaters, installing green infrastructure, and protecting transportation routes.[12]

The Iroquois Gas Corporation operates a natural gas transmission pipeline that runs along the Housatonic River from the northwest to the southwest. Tennessee Gas Pipeline Company operates a natural gas transmission pipeline that runs through the northern portions of the City.

The City has a diverse industrial and manufacturing sector which has been located close to the interstate highway system, rail lines, and Housatonic river. The retail, medical, and civic land uses are located in the center of Milford but have spread along the Route 1 corridor. The southern portion of Milford is made up of older housing stock and smaller parcels with proximity to Long Island Sound. The northern part of Milford has newer housing stock with larger parcels and lower density, making it feel more suburban. Recreation and open space can be found extensively throughout Milford, especially in its City and State beaches. The City has also become a destination for consumer goods and services.[13]

[10] "South Central Region: Plan of Conservation & Development 2018-2023 DRAFT Update." (2018). South Central Regional Council of Governments. Pg. 71.

[11] "Tree Canopy Assessment." (2019). South Central Regional Council of Governments.

[12] "Southern CT: Regional Framework for Coastal Resilience." (2017). South Central Regional Council of Governments, MetroCOG, Nature Conservancy.

[13] "Milford 2012-2022 Plan of Conservation and Development." (2012). Milford, Connecticut.

2. Hazard Profiles

2.1 Critical Facilities

There are 21 critical facilities in Milford, as seen in
Table 1, plus several wastewater pump stations throughout the City. There are two designated emergency shelter in the City: Jonathan Law High School and the Milford Senior Center.

Table 1. Critical Facilities in the City of Milford.

Facility	Location	Emergency Power Supply?	Shelter?	In Floodplain or Coastal Flood Hazard Area?	In Surge Zones?
Emergency Services					
Fire HQ	72 New Haven Ave	Yes	No	No	No
East Side Fire Station	980 New Haven Ave	Yes	No	No	No
North Side Fire Station	55 Wheelers Farms Rd	Yes	No	No	No
West Side Fire Station	349 Naugatuck Ave	Yes	No	No	No
Police Station/EOC	430 Boston Post Rd	Yes	No	No	No
Municipal Facilities					
Milford Health Department	82 New Haven Ave	Yes	No	No	No
City Hall	110 River St	N/A	No	Yes	Yes
Parsons Government Center	70 West River St	N/A	No	No	No

Facility	Location	Emergency Power Supply?	Shelter?	In Floodplain or Coastal Flood Hazard Area?	In Surge Zones?
Public Works Building	83 Ford St	Yes	No	No	No
Shelters		N/A			
Jonathan Law High School	20 Lansdale Ave	Yes	Yes	No	Yes
Milford Senior Center	9 Jepson Dr	Yes	Secondary	No	No
Health Care and Senior Living Facilities					
Milford Hospital	300 Seaside Ave	Yes	No	No	No
West River Healthcare Center	245 Orange Ave	Yes	No	No	No
Golden Hill Rehab	2028 Bridgeport Ave	Yes	No	No	No
Milford Health and Rehabilitation	195 Platt St	Yes	No	No	No
Carriage Green	77 Plains Rd	N/A	No	No	No
Four Corner's Rest Home	306 Naugatuck Ave	N/A	No	No	No
Acord Inc	300 Third Ave	N/A	No	No	No
DaVita Dialysis	470 Bridgeport Ave	N/A	No	No	No
Water and Wastewater					
Housatonic WWTF	1225 Oronoque Rd	Yes	No	Yes	Yes

Facility	Location	Emergency Power Supply?	Shelter?	In Floodplain or Coastal Flood Hazard Area?	In Surge Zones?
Beaverbrook WWTF	75 Deerwood Ave	Yes	No	Yes	Yes
Wastewater Pumping Stations	45 locations throughout the City	Some	No	Some	Some

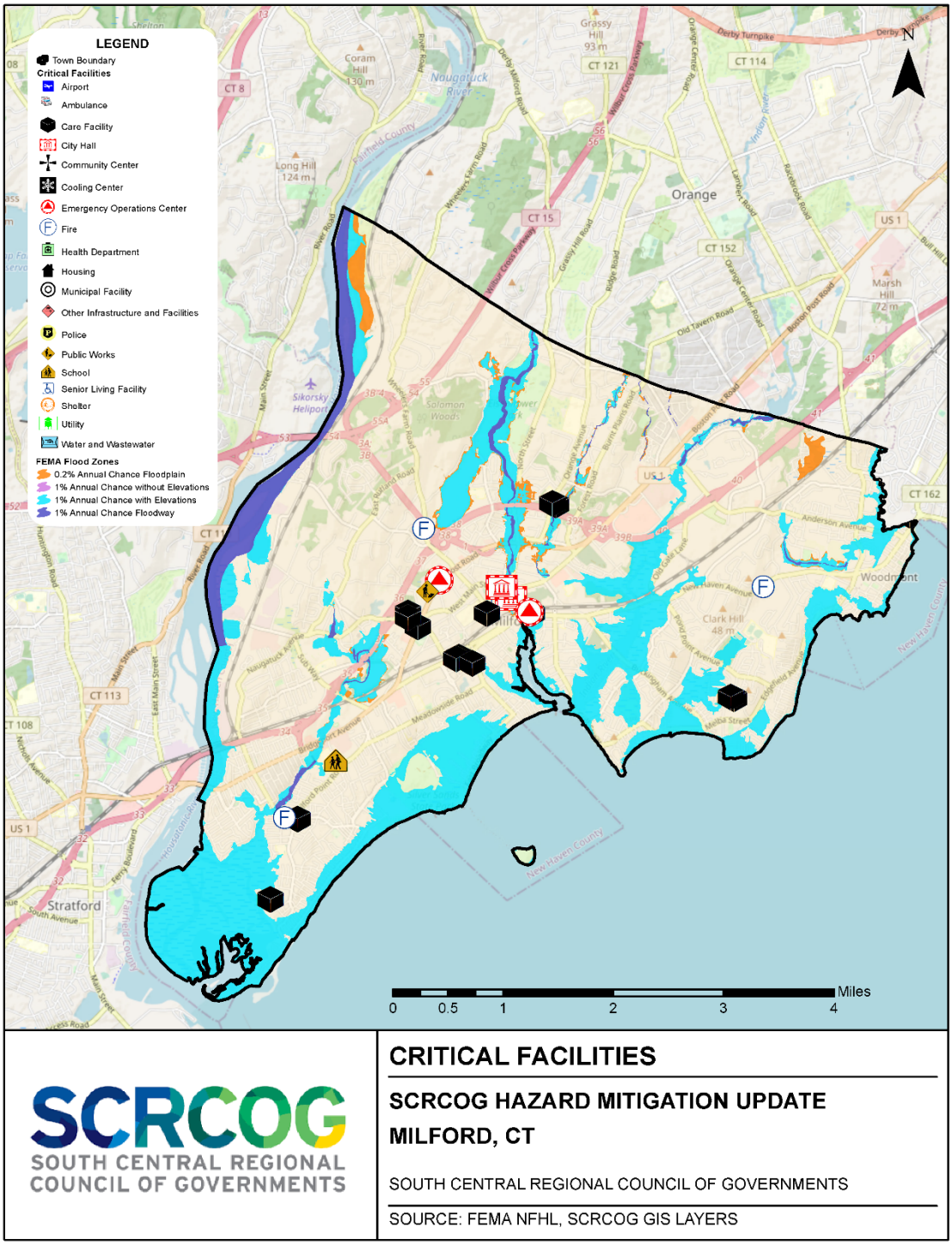

Figure 1. Milford FEMA Flood Zones and Critical Facilities.

2.2 Vulnerable Assets

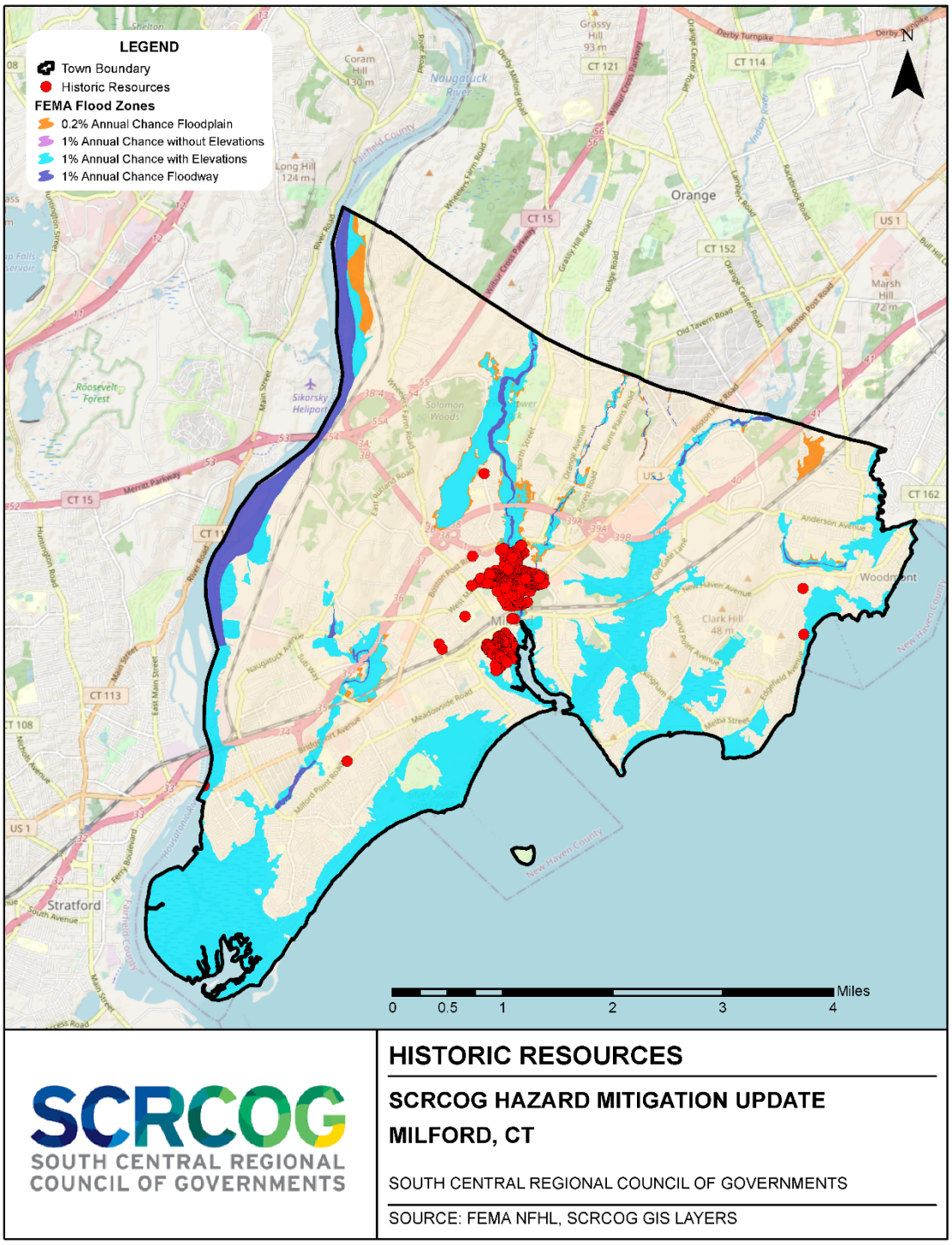

Figure 2. Milford FEMA Flood Zones and Historic Resources.

Repetitive Loss and Severe Repetitive Loss Properties

In addition to the spatial analysis conducted above, summary information for repetitive flood loss and severe repetitive flood loss properties within the City of Milford also provides an indication of vulnerable assets, especially with regard to properties insured under the National Flood Insurance Program that have experienced repeated flooding (
Table 2).[14]

Table 2. Milford Repetitive and Severe Repetitive Flood Loss Summary.

	Number of Losses	Number of Properties	Building Payments	Contents Payments	Total Payments
Repetitive Loss	1511	533	$45,848,365	$4,479,839	$50,328,204
Severe Repetitive Loss	142	27	$4,647,305	$652,813	$5,300,118

The majority of the RL properties are single-family homes. Ten are residential condominium units and 21 are multi-family homes. Only seven RL properties are non-residential, and these appear to be commercial and industrial uses.

As of July 31, 2017, the City of Milford had a total of 3,149 claims totaling $74,857,344 in losses for all NFIP-insured structures.

As of March 31, 2022, the City of Milford has had a total of 3,168 losses, with claims totaling $76,003,313.

2.3 Historic Disasters

2.3.1 Federally Declared Events

Over the past two decades alone, six historic disaster events have occurred that have shaped how disaster response and recovery is handled across the United States. These events include Hurricanes Katrina, Sandy, Irma, Maria, and Harvey, along with the California wildfires in 2017. While not all of these events directly impacted the SCRCOG region, or the State of Connecticut, hazard mitigation planning has been driven by these catastrophic events.

The first federal act of relief occurred in 1803 following a destructive fire in Portsmouth, New Hampshire where Congress provided relief in the form of suspended bond payments. Over a century and a half later

[14] Based on information provided by the Federal Emergency Management Agency current as of 12/31/2012.

in 1979 the Federal Emergency Management Agency (FEMA) was created and tasked with nationwide emergency management. However, emergency and disaster declarations for the State of Connecticut have been made since 1954. These have included hurricanes, blizzards, severe wind and rainstorms, and tornadoes.

Since 2016, specifically for New Haven County, there have been three FEMA Disaster Declarations (DR), and two Emergency Declarations (EM) (

Table 3). These are in addition to the COVID-19 DR and EM that were declared in March 2020. FEMA declarations are made when it is determined that federal assistance is needed to supplement State and Tribal efforts in the wake of an event.

In addition to the FEMA declarations, the United States Department of Agriculture (USDA) declared eight agriculturally related disasters in the same time frame; two of which were also declared by FEMA. These USDA declarations make emergency loans available to agricultural producers in the designated counties.

Table 3. FEMA and USDA Disaster Declarations for New Haven County.

Event	Disaster	Date of Event	Date Declared
FEMA Disaster Declarations for New Haven County			
Severe Storms, Tornadoes, and Straightline Winds	DR-4385-CT	May 15, 2018	August 20, 2018
Tropical Storm (T.S.) Isaias*	DR-4580-CT EM-3535-CT	August 4, 2020	January 12, 2021
Hurricane Henri	EM-3564-CT	August 21-24, 2021	August 22, 2021
Hurricane Ida*	DR-4629-CT	September 1-2, 2021	October 30, 2021
USDA Declared Disasters for New Haven County			
Frost and Freeze	S4048	February 12, 2016	September 21, 2016
Drought	S4055	August 2, 2016	September 28, 2016
Excessive Rainfall	S4478	August 1, 2018	March 20, 2019
Drought	S4814	September 22, 2020	October 14, 2020
Drought	S4825	September 29, 2020	October 15, 2020

Event	Disaster	Date of Event	Date Declared
Tropical Storm Elsa	S5069	July 9, 2021	August 30, 2021
* Indicates FEMA declaration that was also made by USDA			

In New Haven County, the May 2018 storms (DR-4385) caused $8,187,833 worth of damage, with federal assistance totaling $6,213,312. Tropical Storm Isaias (DR-4580) resulted in $4,656,424 worth of damage and a federal assistance totaling $3,915,143. For reference, Hurricane Sandy resulted in over $14 million of damage. Public assistance (PA) was requested by most communities in the region.

In addition, Individual Assistance (IA) housing assistance for owners and renters was distributed in the wake of Hurricane Ida (DR-4629). Homeowners throughout the region received $570,033 in assistance and renters received $37,112.

2.3.2 National Centers for Environmental Information

The NOAA National Centers for Environmental Information (NCEI) maintains a storm events database that documents significant weather events and their impacts including injuries and loss of life, and economic impacts and property damage. Event types in this database generally include severe storm events such as hurricanes, thunderstorm, or windstorms, hail events, snow and freezing events, and several types of flood events such as flash or coastal floods.

Between 2017 and 2021 the SCRCOG region experienced 70 different events including floods, hail, high windstorms, and tornadoes (
Table 4). Property damage throughout the region for these 70 events was estimated to be $1,054,500. Losses specific to the City of Milford are discussed in section 0.

Table 4. NCEI Events Between 2017 and 2021.

Event Type	Number of Events
Flash Flood	25
Flood	1
Hail	2
Thunderstorm Wind	39
Tornado	3

Total	**70**

2.3.3 Drought Occurrences

The United States Drought Monitor (USDM) is a nation-wide map depicting which areas throughout the U.S are in drought, and the intensity of that drought. The USDM is developed via data syntehsis and observations from drought experts and local observers. The chart seen in Figure 3 is a graphictal representation of the drought periods in New Haven County from 2015 to the end of 2021. The dark organge and red areas indicate a more severe drought period. Most recently, New Haven County has experienced an extreme drought (D3) in 2016 into 2017, with a severe drought (D2) in 2020.

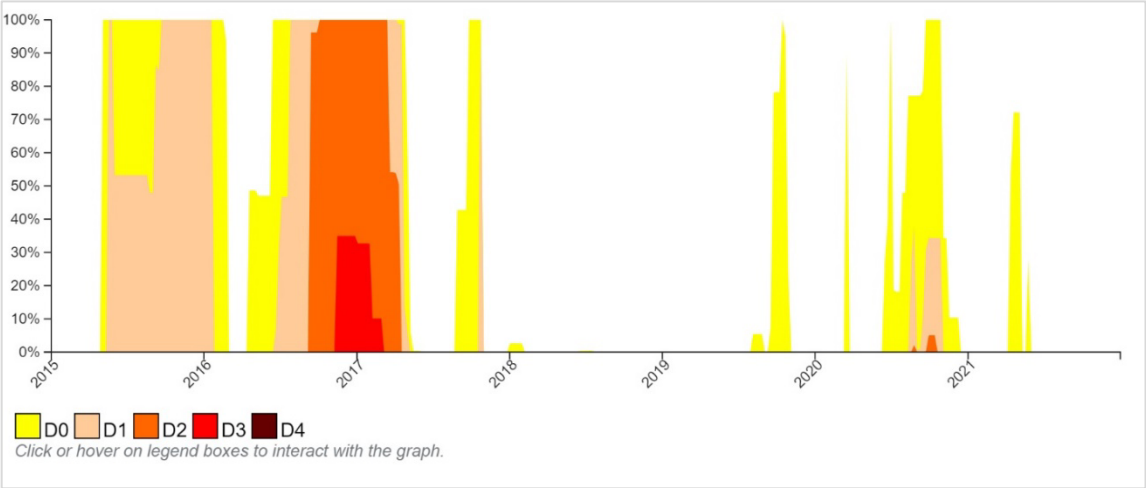

Figure 3. United States Drought Monitor (USDM) Drought Intensity for New Haven County from 2015 through 2021.

Another tool used to charcterize drought conditions is the Standardized Precipitation Index (SPI). This index identifies drought areas based on the deviation of recent preiciptation levels in comparison to the long-term average. Ultiamtely, if rainfall levels have been “lower than normal” or “wetter than normal” in a certin timeframe, the SPI represents these highs and lows at a nationl scale. The chart seen in Figure 4 shows the SPI for New Haven County from 2015 to the end of 2021. In comparison to the USDM, the fluctuations in drought periods are relatively synonmous, however, the SPI indiciated a more severe period of droght between 2015 and 2017 than the USDM. This is because the USDM is based on several other factors aside from just precipitation, hence why the USDM is typically used to determing local drought measures and needs. The blue areas on the chart are the priods of time that were wetter than usual with higher precipitation.

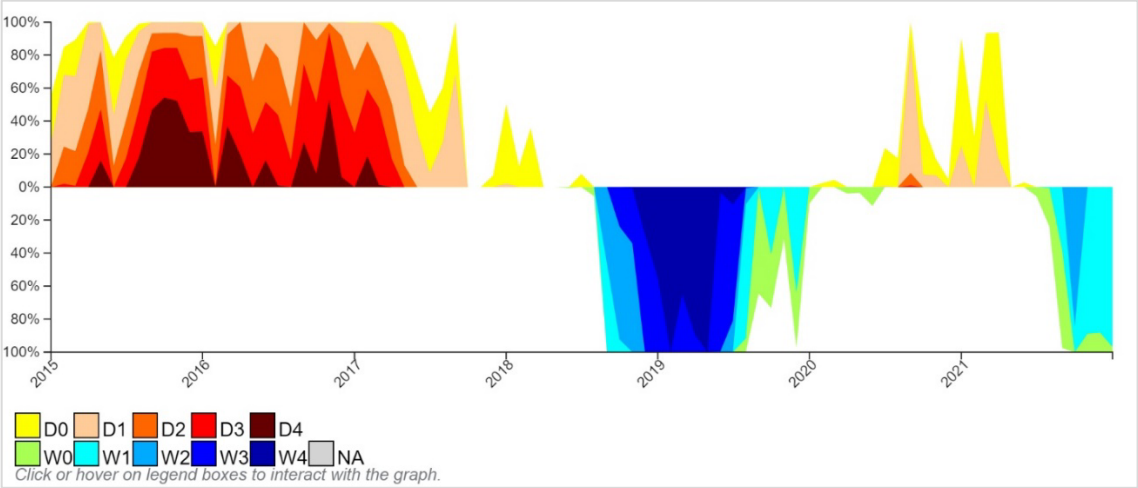

Figure 4. Standardized Precipitation Index (SPI) for New Haven County from 2015 through 2021.

The impacts of drought vary throughout the SCRCOG region and are often felt over a longer period of time and are related to social, ecological, and economic concerns. The 2016 drought, the most extreme in recent years, resulted in mandated water conservation measures, and required some water utilities in the region, to make necessary water management changes. In addition, eight farm operations received assistance from the United States Department of Agriculture in the wake of the event in the amount of $78,590.

The severe drought in 2020 also impacted the region in various ways. At a statewide level, drinking water reservoirs were at 67% of capacity and 83.5% of normal. With decreased precipitation, and drinking water reservoir levels low, the Connecticut Interagency Drought Workgroup placed New Haven County in a Stage 1 drought per the State Drought Plan. Specifically, the Northeast Regional Climate Center identified the City of New Haven as having one of the highest rainfall deficits in the State at -11.09 inches average rainfall. During the 2020 drought, private wells were reportedly drying up, there were reports of livestock farms needing water, and water utilities throughout the region and state were experiencing reduced supply.

On October 15, 2020, the USDA identified New Haven County as a contiguous disaster county, making farm operators eligible to be considered for assistance from Farm Service Agency (FSA). Three farms in the region received assistance as a result of the drought in the amount of $17,982.

2.3.4 Wildland Urban Interface (WUI)

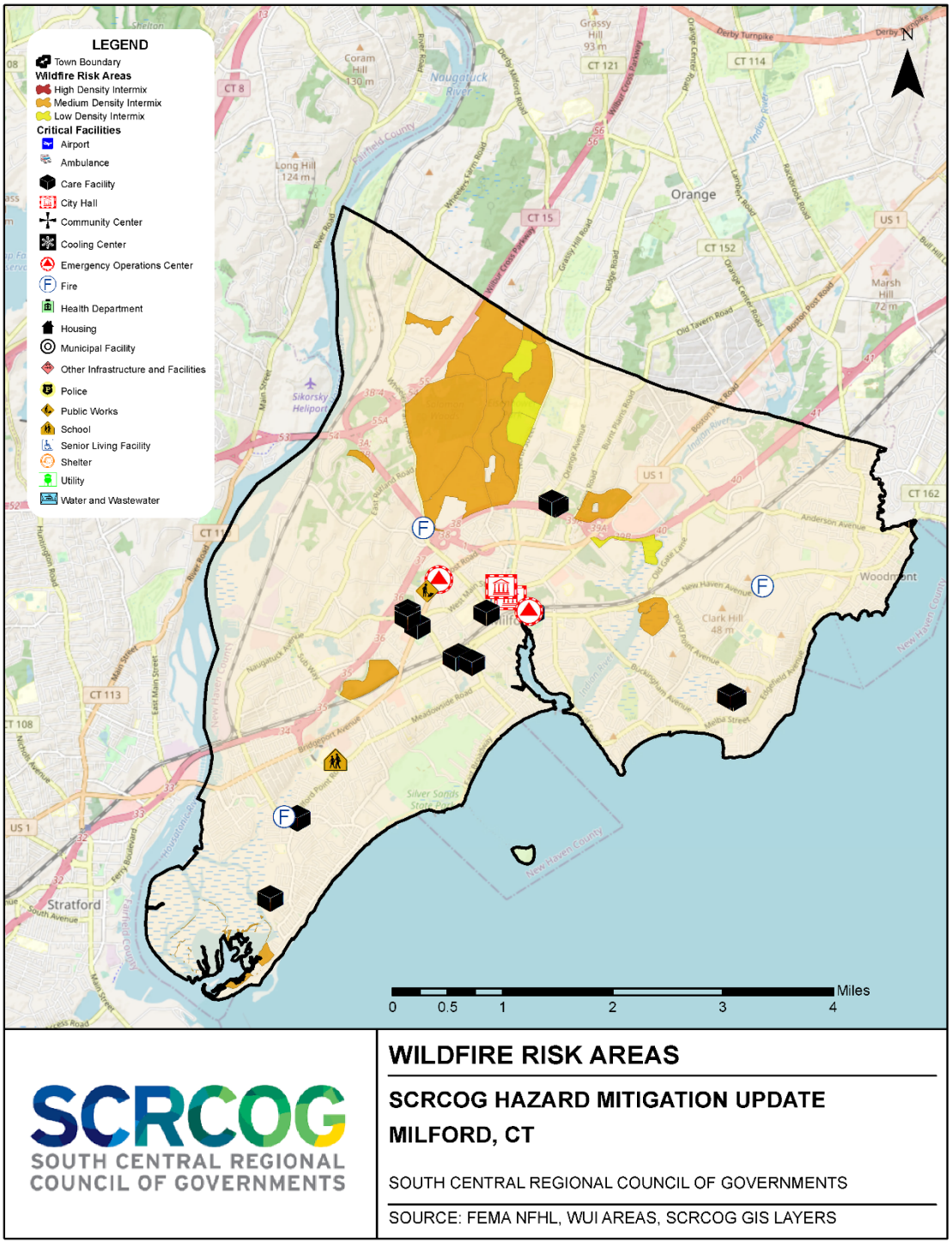

Figure 5. Milford WUI and Critical Facilities.

3. Risk Analysis

3.1 Vulnerable Assets: Exposure Analysis

Vulnerable assets were identified by intersecting GIS-based asset inventories with known hazard boundaries to determine the numbers of parcels, critical facilities, and historic assets. This results in an estimation of vulnerable assets for the entire region, by hazard as shown in
Table 5. Drought exposure was estimated using the Connecticut DPH assumed private well data develop in 2021. The wildfire hazard boundary was defined by those parcels within the wildland-urban interface and intermix and that were also assumed to be a private well. The assumed presence of a private well indicates a lack of public water supply, and potentially reduced firefighting capacity. The estimated value of at risk assets is based on the City's latest property tax values. Scenarios are cumulative, i.e., the 0.2% annual chance estimates also include the values and numbers of the 1% annual chance event.

Table 5. City of Milford Vulnerable Assets Exposure Analysis.

Hazard	At-Risk Parcels		At-Risk Facilities		At-Risk Historic Assets	
	Value	Number	Value	Number	Value	Number
Hurricane/Tropical Storm	$6,727,758,935	19,380	$72,133,080	21	$164,713,240	296
Severe Thunderstorm	$6,727,758,935	19,380	$72,133,080	21	$164,713,240	296
Severe Winter Storm	$6,727,758,935	19,380	$72,133,080	21	$164,713,240	296
Tornado	$6,727,758,935	19,380	$72,133,080	21	$164,713,240	296
Drought	$24,023,570	72	-	-	-	-
Flood						
1% Annual Chance	$1,870,797,611	4,377	$27,909,550	$27,909,550	$38,301,750	51
0.2% Annual Chance	$1,930,316,861	4,500	$29,201,370	4	$31,117,670	46
VE Zone	$480,894,211	806	-	-	-	-
Storm Surge						

Hazard	At-Risk Parcels		At-Risk Facilities		At-Risk Historic Assets	
Category 1	$960,425,271	2,031	-	-	$1,463,490	3
Category 2	$1,534,318,171	3,520	$21,148,550	1	$2,219,910	5
Category 3	$1,896,035,501	4,679	$21,148,550	1	$3,953,430	9
Category 4	$2,185,355,341	5,636	$21,148,550	1	$11,370,700	25
Earthquakes	$6,727,758,935	19,380	$72,133,080	21	$164,713,240	296
Wildfire	$36,368,500	86	-	-	-	-

3.2 Hazard Losses

3.2.1 Federal Assistance

Of the five natural hazard emergency and disaster declarations, the City received FEMA PA funds in the wake of two event: T.S. Isaias and the COVID-19 Pandemic (
Table 6).

Table 6. Federal Funds Received from Disaster Declarations.

Event	Disaster	Assistance Type	Federal Funding Received	Total Project Need (Damages)
Tropical Storm (T.S.) Isaias	DR-4580-CT EM-3535-CT	PA	$633,378	$703,569
Covid-19	DR-4500-CT EM-3439-CT	PA	$106,875	$106,875

Funds received by the City were primarily distributed for debris removal, with just about 26% of the $810,444 received going to protective measures, 4% for public buildings, and less than 1% for state management and coordination (Figure 6). Specifically, some of the funds were distributed for damage to the Adams Avenue pump station generator, roof damage reported by the housing authority, and for emergency response materials for COVID-19.

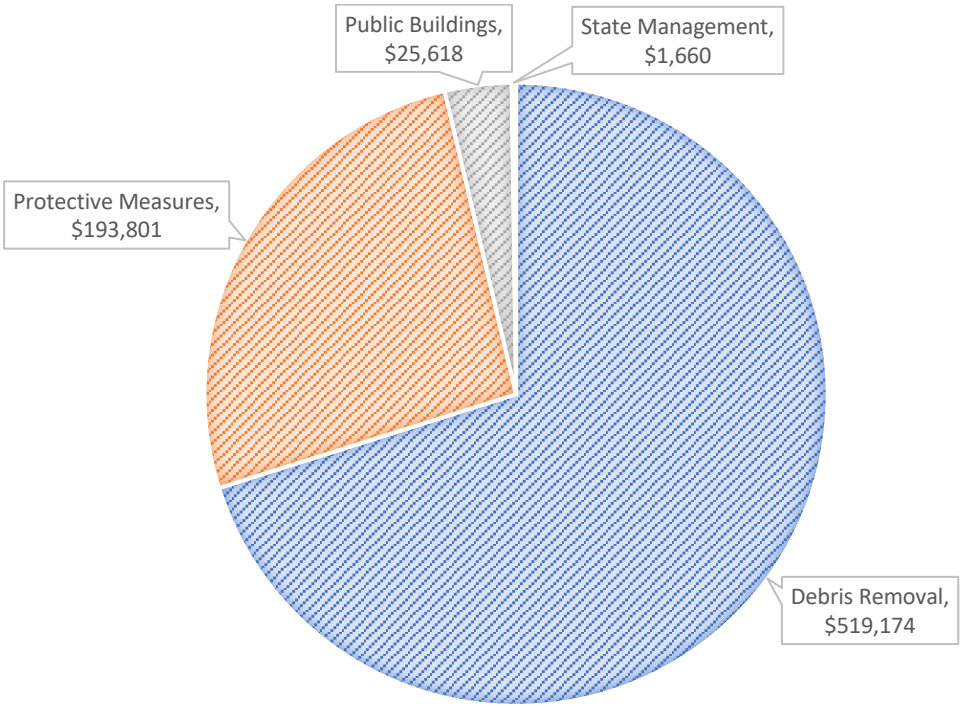

Figure 6. Federal Funds Received by Category.

In addition to PA funds, FEMA IA disbursement were made to 14 property owners in the City in the wake of Hurricane Ida. The payments totaled $77,792.

3.2.2 National Centers for Environmental Information (NCEI)

The NCEI documentation has not identified any significant events for the City of Milford since 2017. The most recently reported event from NCEI was in 2015 for the Village of Devon; a thunderstorm that resulted in a reported $500 in property damage.

3.3 Loss Estimates

3.3.1 Sea Level Rise (SLR)

Table 7. Buildings in Milford affected by the SLR Base Scenario.

Milford	Buildings Affected	Critical Facilities	Historic Resources
Base Scenario			
Mean Higher High Water (MHHW)	77	0	1
10-year Flood Event	732	0	1
30-year Flood Event	960	0	1
50-year Flood Event	1,044	0	1
100-year Flood Event	1,172	0	1
500-year Flood Event	1,172	0	1

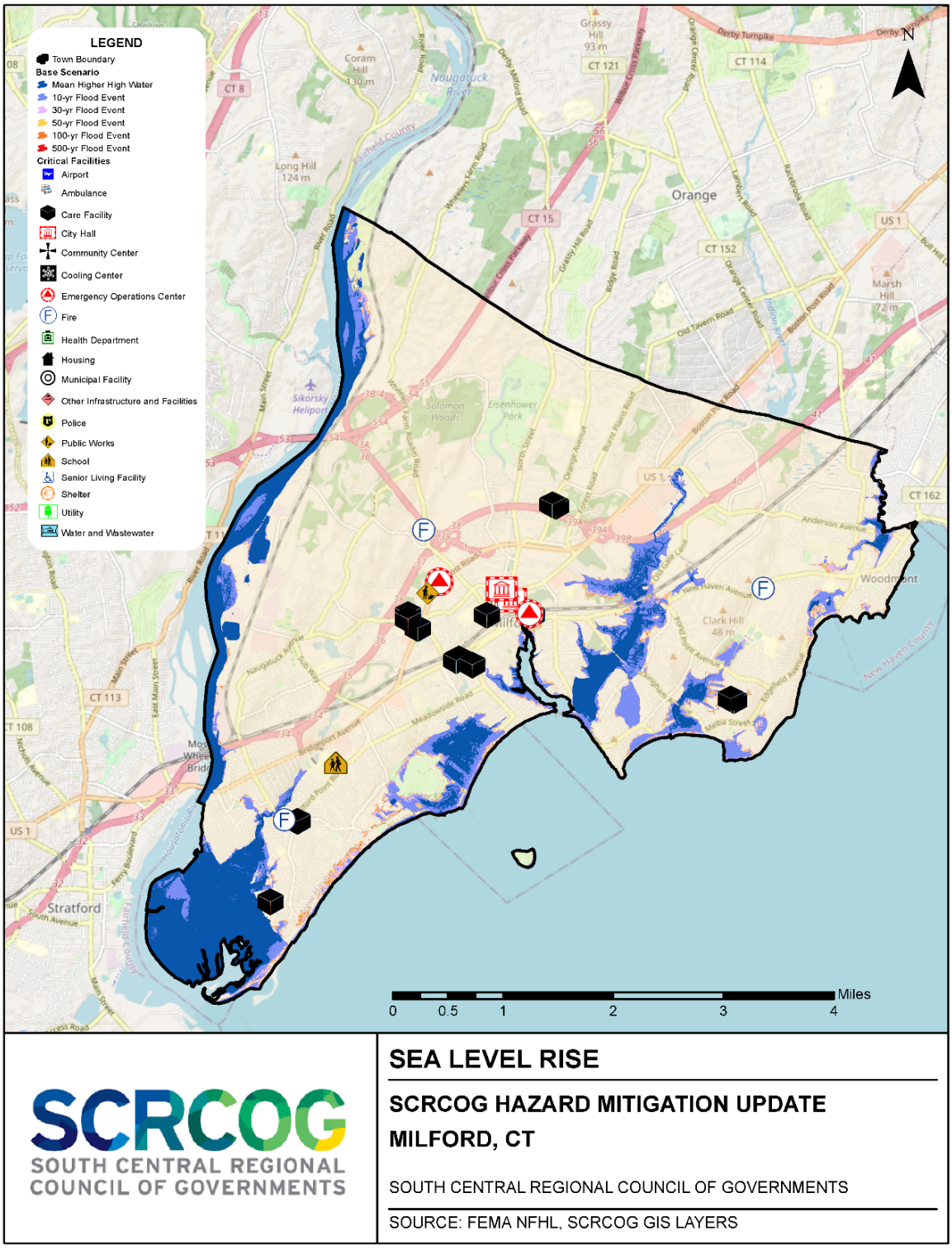

Figure 7. Milford SLR Base Conditions Scenario.

Table 8. Buildings in Milford affected by the SLR Future Conditions Scenario.

Milford	Buildings Affected	Critical Facilities	Historic Resources
Future Conditions Scenario			
Mean Higher High Water (MHHW) +1 foot	170	0	1
Mean Higher High Water (MHHW) +20 inches	222	0	1
10-year Flood Event + 20 inches	1,172	0	1
30-year Flood Event + 20 inches	1,573	0	1
50-year Flood Event + 20 inches	1,685	0	1
100-year Flood Event + 20 inches	1,830	0	1
500-year Flood Event + 20 inches	2,064	0	1

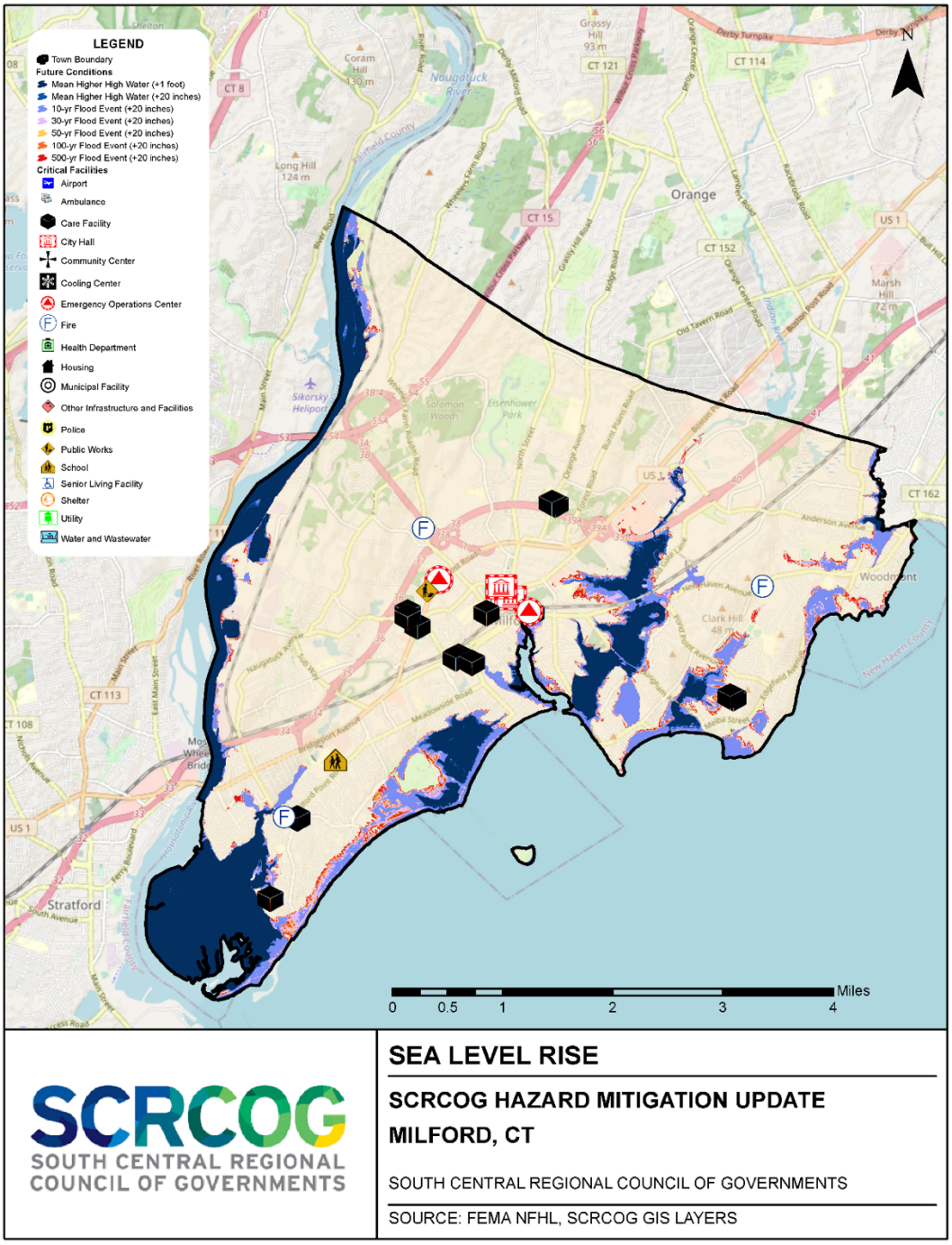

Figure 8. Milford SLR Future Conditions Scenario.

3.4 HAZUS-MH Analysis

Hazus-MH (Hazus) v5.1 was used to complete the earthquake, hurricane wind, and both riverine and coastal flood analyses for vulnerability and loss estimates for the 2022 plan update. The Hazus software was developed by FEMA and the National Institute of Building Sciences. For the earthquake module, the U.S. Census tracts are the smallest extent in which the model runs; for the hurricane and flood modules, U.S. Census blocks were used. Multi-frequency depth grids were used for the riverine flood analysis, but only the 100-year coastal depth grid was available and used for analysis. Hazus was also used to calculate Storm Surge using the National Hurricane Center's (NHC) Sea, Lake, and Overland Surges from Hurricanes (SLOSH) Maximum of the Maximum Envelope of Waters (MEOWs) (MOM) depth grid.

3.4.1 Earthquake

The earthquake analysis was run based on the largest earthquake in Connecticut history, which occurred in East Haddam on May 16, 1791. Specific parameters include:

- Longitude of epicenter: -72.40
- Latitude of epicenter: 41.50
- Depth: 10.00 km.
- Magnitude: 6.40
- Attenuation function: CEUS 2008

After the earthquake analysis was performed, two tables for each municipality were created based off the tables for the 2018 update: Numbers of Buildings Damaged and anticipated extent of damage (Table 9) and Total Building-Related Economic Loss (

Table 10) which includes the total economic loss by general occupancy type. An additional table was also created: Other Earthquake Impacts (
Table 11) which includes information related to debris generated, number of displaced households, and the number of individuals who need to seek temporary shelter. Including this table allows these impacts to be compared across different hazards.

Table 9. Number of Buildings Damaged from the East Haddam Earthquake Scenario for the Town of Milford.

Milford	Slight	Moderate	Extensive	Complete	Total
2022 Count	43,658	42,038	41,414	41,311	168,421

Table 10. Total Building Related Economic Loss from the East Haddam Earthquake Scenario for the Town of Milford.

Milford	Residential	Commercial	Industrial	Others	Total
2022 Losses	$68,312,718	$43,565,892	$16,085,441	$5,220,198	$133,184,250

Table 11. Other Earthquake Impacts from the East Haddam Earthquake Scenario for the Town of Milford.

Milford	Debris Generated (Tons)	Households Displaced	Individuals Seeking Temporary Shelter
2022 Results	37	90	43

3.4.2 Hurricane

Hazus uses historical hurricane tracks and computer modeling to identify the probable tracks of a range of hurricane events and then assigns potential wind gusts that result. Widespread extreme thunderstorm wind events, such as those associated with well-developed squall lines, may have wind gusts of a similar magnitude to those of the 50- or 100-year hurricane wind event. A 1000-year event is the rough equivalent of a strong Category 1 or low-end Category 2 hurricane (or weak to mid-strength EF-1 tornado) with 3-second wind gusts of up to around 95 mph.

For the hurricane hazard, three tables for the Town of Milford were created based off the tables for the 2018 update: Numbers of Buildings Damaged and anticipated level of damage (
Table 12), Building-Related Economic Loss (Table 13), and Other Hurricane Impacts (Table 14) which includes information related to debris generated, number of displaced households, and the number of individuals who need to seek temporary shelter. These tables broke down the values for the six hurricane return periods (10-, 4-, 2-, 1-, 0.2-, and 0.01-percent-annual-chance).

Table 12. Number of Buildings Damaged from the Probabilistic Hurricane Scenario for the Town of Milford.

Milford	Return Period	Minor	Moderate	Severe	Destruction	Total
2022 Results	10-year	0	0	0	0	0
	20-year	18	1	0	0	19
	50-year	67	3	0	0	70

Milford	Return Period	Minor	Moderate	Severe	Destruction	Total
	100-year	559	44	1	0	605
	200-year	2,275	317	14	5	2,612
	500-year	4,645	1,114	98	57	5,915
	1,000-year	6,861	2,733	489	287	10,370

Table 13. Total Building Related Economic Loss from the Probabilistic Hurricane Scenario for the Town of Milford.

Milford	Return Period	Minor	Moderate	Severe	Destruction	Total
2022 Results	10-year	$0	$0	$0	$0	$0
	20-year	$33,157	$1,169	$62	$0	$34,387
	50-year	$122,194	$5,090	$259	$0	$127,543
	100-year	$1,085,625	$75,761	$2,582	$80	$1,164,048
	200-year	$4,508,361	$576,775	$28,133	$11,503	$5,124,772
	500-year	$9,281,073	$2,101,852	$196,661	$115,100	$11,694,687
	1,000-year	$13,799,336	$5,264,610	$973,072	$573,944	$20,610,962

Table 14. Other Hurricane Impacts from the Probabilistic Hurricane Scenario for the Town of Milford.

Milford	Return Period	Debris Generated (Tons)	Households Displaced	Individuals Seeking Temporary Shelter
2022 Results	10-year	0	0	0
	20-year	664	0	0
	50-year	1,825	0	0
	100-year	7,637	8	3
	200-year	20,376	77	35

Milford	Return Period	Debris Generated (Tons)	Households Displaced	Individuals Seeking Temporary Shelter
	500-year	39,927	248	119
	1,000-year	80,419	793	382

3.4.3 Riverine Flood

Floods are often described in terms of annual percentage chance of occurrence. Floodplains have been delineated by FEMA to reflect the 1- and 0.2-percent-annual-chance flood events previously known as 100-year and 500-year floods, respectively. The area that has a 1 percent chance annually to flood each year is delineated as a Special Flood Hazard Area (SFHA) for the purposes of the National Flood Insurance Program (NFIP). The 0.2-percent-annual-chance floodplain indicates areas of moderate flood hazard.

Hazus-MH v5.1 was used to complete the riverine flood analysis for vulnerability and loss estimates for this plan. The Hazus software was developed by FEMA and the National Institute of Building Sciences. A The flood loss estimation methodology consists of two modules that carry out basic analytical processes: flood hazard analysis and flood loss estimation analysis. The flood hazard analysis module uses characteristics, such as frequency, discharge and ground elevation to estimate flood depth, flood elevation and flow velocity. The flood loss estimation module calculates physical damage an economic loss from the results of the hazard analysis.

A Hazus Level 2 analysis was performed for the Town of Milford with user-provided depth grids. The flood model was used to run a multi-frequency depth grid scenario which included the following return periods: 10- percent (10 year), 4-percent (25 year), 2-percent (50 year), 1-percent (100 year), as well as the 0.2-percent (500 year). The average annualized losses (AAL) for flood were calculated using this multi-frequency scenario. For analysis purposes, the U.S. Census blocks are the smallest extent in which the model runs. Hazus generates economic loss estimates based on direct building damages and business interruption.
Table 15 shows the annualized losses for the riverine flood scenario.

Table 15. Annualized Riverine Flood Loss Estimates for the Town of Milford.

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Direct					

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Building	$737,000	$230,000	$22,000	$17,000	$1,006,000
Contents	$326,000	$702,000	$59,000	$124,000	$1,211,000
Inventory	$0	$4,000	$8,000	$3,000	$15,000
Subtotal	$1,063,000	$936,000	$89,000	$144,000	$2,232,000
Business Interruption					
Income	$12,000	$776,000	$1,000	$44,000	$833,000
Relocation	$215,000	$141,000	$1,000	$15,000	$372,000
Rental Income	$78,000	$106,000	$0	$1,000	$185,000
Wage	$27,000	$692,000	$1,000	$98,000	$818,000
Subtotal	$332,000	$1,715,000	$3,000	$158,000	$2,208,000
Total	**$1,395,000**	**$2,651,000**	**$92,000**	**$302,000**	**$4,440,000**

Table 16 to Table 20 contain the riverine flood loss estimates for each percent-annual-chance depth grid included in the multi-frequency hazard scenario.

Table 16. 10-percent-annual-chance Riverine Flood Loss Estimates for the Town of Milford.

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Direct					
Building	$4,337,000	$1,335,000	$143,000	$98,000	$5,913,000
Contents	$1,893,000	$4,100,000	$350,000	$660,000	$7,003,000
Inventory	$0	$40,000	$62,000	$9,000	$111,000
Subtotal	$6,230,000	$5,475,000	$555,000	$767,000	$13,027,000

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Business Interruption					
Income	$83,000	$5,703,000	$4,000	$286,000	$6,076,000
Relocation	$1,572,000	$943,000	$5,000	$92,000	$2,612,000
Rental Income	$567,000	$714,000	$1,000	$6,000	$1,288,000
Wage	$200,000	$4,870,000	$9,000	$618,000	$5,697,000
Subtotal	$2,422,000	$12,230,000	$19,000	$1,002,000	$15,673,000
Total	**$8,652,000**	**$17,705,000**	**$574,000**	**$1,769,000**	**$28,700,000**

Table 17. 4-percent-annual-chance Riverine Flood Loss Estimates for the Town of Milford.

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Direct					
Building	$6,567,000	$2,059,000	$203,000	$171,000	$9,000,000
Contents	$2,888,000	$6,263,000	$479,000	$1,120,000	$10,750,000
Inventory	$0	$70,000	$82,000	$18,000	$170,000
Subtotal	$9,455,000	$8,392,000	$764,000	$1,309,000	$19,920,000
Business Interruption					
Income	$107,000	$7,366,000	$5,000	$428,000	$7,906,000
Relocation	$2,074,000	$1,288,000	$6,000	$153,000	$3,521,000
Rental Income	$768,000	$982,000	$2,000	$12,000	$1,764,000
Wage	$256,000	$6,443,000	$12,000	$904,000	$7,615,000
Subtotal	$3,205,000	$16,079,000	$25,000	$1,497,000	$20,806,000

Total	**$12,660,000**	**$24,471,000**	**$789,000**	**$2,806,000**	**$40,726,000**

Table 18. 2-percent-annual-chance Riverine Flood Loss Estimates for the Town of Milford.

Milford	**2022 Results**				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Direct					
Building	$8,674,000	$2,695,000	$287,000	$240,000	$11,896,000
Contents	$3,824,000	$8,070,000	$641,000	$1,535,000	$14,070,000
Inventory	$0	$95,000	$107,000	$26,000	$228,000
Subtotal	$12,498,000	$10,860,000	$1,035,000	$1,801,000	$26,194,000
Business Interruption					
Income	$138,000	$8,872,000	$9,000	$572,000	$9,591,000
Relocation	$2,518,000	$1,609,000	$9,000	$210,000	$4,346,000
Rental Income	$953,000	$1,224,000	$3,000	$16,000	$2,196,000
Wage	$329,000	$7,819,000	$20,000	$1,195,000	$9,363,000
Subtotal	$3,938,000	$19,524,000	$41,000	$1,993,000	$25,496,000
Total	**$16,436,000**	**$30,384,000**	**$1,076,000**	**$3,794,000**	**$51,690,000**

Table 19. 1-percent-annual-chance Riverine Flood Loss Estimates for the Town of Milford.

Milford	**2022 Results**				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Direct					
Building	$11,296,000	$3,749,000	$427,000	$338,000	$15,810,000
Contents	$5,090,000	$11,075,000	$912,000	$2,042,000	$19,119,000
Inventory	$0	$156,000	$147,000	$43,000	$346,000

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Subtotal	$16,386,000	$14,980,000	$1,486,000	$2,423,000	$35,275,000
Business Interruption					
Income	$169,000	$10,911,000	$13,000	$719,000	$11,812,000
Relocation	$3,072,000	$2,076,000	$12,000	$263,000	$5,423,000
Rental Income	$1,197,000	$1,577,000	$4,000	$19,000	$2,797,000
Wage	$403,000	$9,832,000	$32,000	$1,480,000	$11,747,000
Subtotal	$4,841,000	$24,396,000	$61,000	$2,481,000	$31,779,000
Total	**$21,227,000**	**$39,376,000**	**$1,547,000**	**$4,904,000**	**$67,054,000**

Table 20. 0.2-percent-annual-chance Riverine Flood Loss Estimates for the Town of Milford.

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Direct					
Building	$20,693,000	$6,791,000	$1,020,000	$705,000	$29,209,000
Contents	$10,002,000	$18,864,000	$2,156,000	$3,704,000	$34,726,000
Inventory	$0	$283,000	$365,000	$104,000	$752,000
Subtotal	$30,695,000	$25,938,000	$3,541,000	$4,513,000	$64,687,000
Business Interruption					
Income	$236,000	$15,064,000	$36,000	$1,010,000	$16,346,000
Relocation	$4,759,000	$2,882,000	$37,000	$339,000	$8,017,000
Rental Income	$1,919,000	$2,201,000	$10,000	$24,000	$4,154,000
Wage	$558,000	$13,837,000	$73,000	$2,252,000	$16,720,000

Subtotal	$7,472,000	$33,984,000	$156,000	$3,625,000	$45,237,000
Total	**$38,167,000**	**$59,922,000**	**$3,697,000**	**$8,138,000**	**$109,924,000**

In addition to the multi-frequency analysis, an expanded Level 2 single-frequency 1-percent -annual-chance flood (100-year) scenario was run for SCRCOG to include all the areas outside the multi-frequency scenario footprint. This is to better capture flood losses and to better compare these losses with other communities.
Table 21 shows the expanded 1-percent-annual-chance losses for the Town of Milford riverine flood scenario.

Table 21. Expanded 1-percent-annual-chance Riverine Flood Loss Estimates for the Town of Milford.

Milford	**2022 Results**				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Direct					
Building	$28,033,000	$6,153,000	$1,187,000	$525,000	$35,898,000
Contents	$12,985,000	$18,793,000	$2,086,000	$3,328,000	$37,192,000
Inventory	$0	$242,000	$328,000	$46,000	$616,000
Subtotal	$41,018,000	$25,188,000	$3,601,000	$3,899,000	$73,706,000
Business Interruption					
Income	$438,000	$39,884,000	$93,000	$2,709,000	$43,124,000
Relocation	$23,973,000	$8,827,000	$105,000	$1,419,000	$34,324,000
Rental Income	$9,228,000	$6,474,000	$12,000	$198,000	$15,912,000
Wage	$1,037,000	$36,868,000	$187,000	$11,689,000	$49,781,000
Subtotal	$34,676,000	$92,053,000	$397,000	$16,015,000	$143,141,000
Total	**$75,694,000**	**$117,241,000**	**$3,998,000**	**$19,914,000**	**$216,847,000**

3.4.4 Coastal Flood

Hazus-MH v5.1 was used to complete the coastal flood analysis for vulnerability and loss estimates for this plan. The Hazus software was developed by FEMA and the National Institute of Building Sciences. A The flood loss estimation methodology consists of two modules that carry out basic analytical processes: flood hazard analysis and flood loss estimation analysis. The flood hazard analysis module uses characteristics, such as frequency, discharge, and ground elevation to estimate flood depth, flood elevation and flow velocity. The flood loss estimation module calculates physical damage an economic loss from the results of the hazard analysis.

A Hazus Level 2 analysis was performed for the Town of Milford with a user-provided coastal depth grid. The flood model was used to run a single-frequency depth grid scenario which only included the 1-percent-annual-chance (100-year) return period. While annualized loss is the preferred manner with which to express potential risk for hazard mitigation planning, as it is useful for creating a common denominator by which different types of hazards can be compared, an annual loss was not able to be generated with only the coastal 100-year depth grid developed for this analysis. Future work to improve this assessment would involve creating a full suite of return periods, either independently or through a Flood Risk Project. For analysis purposes, the U.S. Census blocks are the smallest extent in which the model runs. Hazus generates economic loss estimates based on direct building damages and business interruption.
Table 22 shows the 1-percent-annual-chance losses for the coastal flood scenario.

Table 22. 1-percent-annual-chance Coastal Flood Loss Estimates for the Town of Milford.

Milford	**2022 Results**				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Direct					
Building	$179,642,000	$14,461,000	$5,236,000	$1,711,000	$201,050,000
Contents	$166,039,000	$40,424,000	$9,883,000	$9,609,000	$225,955,000
Inventory	$0	$632,000	$1,406,000	$62,000	$2,100,000
Subtotal	$345,681,000	$55,517,000	$16,525,000	$11,382,000	$429,105,000
Business Interruption					
Income	$241,000	$35,614,000	$220,000	$3,927,000	$40,002,000
Relocation	$47,910,000	$7,131,000	$180,000	$1,546,000	$56,767,000

Rental Income	$17,863,000	$5,202,000	$24,000	$228,000	$23,317,000
Wage	$568,000	$34,802,000	$446,000	$16,688,000	$52,504,000
Subtotal	$66,582,000	$82,749,000	$870,000	$22,389,000	$172,590,000
Total	**$412,263,000**	**$138,266,000**	**$17,395,000**	**$33,771,000**	**$601,695,000**

3.4.5 Storm Surge

Hazus-MH v5.1 was used to complete the storm surge analysis for vulnerability and loss estimates for this plan. The Hazus software was developed by FEMA and the National Institute of Building Sciences. A Hazus Level 2 analysis was performed using user-provided depth grids. Table 23 represents the storm surge inundation for the Town of Milford. The NHC's SLOSH MOM model was used for this analysis. The flood model was utilized to run four separate single-frequency depth grid scenarios for the Category 1 to 4 hurricanes and a loss estimate was determined for each hurricane Category (
Table 23 to
Table 26). Figure 9 shows the location of the storm surge areas in Milford and their relation to critical facilities.

Table 23. Category 1 Storm Surge using Maximum of MEOWs for the Town of Milford.

Milford	**2022 Results**				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Direct					
Building	$165,020,000	$15,620,000	$5,820,000	$1,584,000	$188,044,000
Contents	$151,340,000	$45,111,000	$11,252,000	$9,617,000	$217,320,000
Inventory	$0	$724,000	$1,586,000	$53,000	$2,363,000
Subtotal	$316,360,000	$61,455,000	$18,658,000	$11,254,000	$407,727,000
Business Interruption					
Income	$282,000	$37,278,000	$249,000	$4,042,000	$41,851,000
Relocation	$48,675,000	$9,121,000	$259,000	$2,088,000	$60,143,000
Rental Income	$18,411,000	$6,660,000	$32,000	$289,000	$25,392,000

Wage	$666,000	$37,048,000	$483,000	$16,908,000	$55,105,000
Subtotal	$68,034,000	$90,107,000	$1,023,000	$23,327,000	$182,491,000
Total	**$384,394,000**	**$151,562,000**	**$19,681,000**	**$34,581,000**	**$590,218,000**

Table 24. Category 2 Storm Surge using Maximum of MEOWs for the Town of Milford.

Milford	**2022 Results**				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Direct					
Building	$419,476,000	$40,989,000	$13,061,000	$4,351,000	$477,877,000
Contents	$374,791,000	$106,682,000	$25,272,000	$22,261,000	$529,006,000
Inventory	$0	$1,869,000	$3,405,000	$174,000	$5,448,000
Subtotal	$794,267,000	$149,540,000	$41,738,000	$26,786,000	$1,012,331,000
Business Interruption					
Income	$444,000	$70,560,000	$437,000	$7,124,000	$78,565,000
Relocation	$84,455,000	$18,059,000	$475,000	$3,685,000	$106,674,000
Rental Income	$32,424,000	$13,282,000	$66,000	$532,000	$46,304,000
Wage	$1,046,000	$72,220,000	$843,000	$29,719,000	$103,828,000
Subtotal	$118,369,000	$174,121,000	$1,821,000	$41,060,000	$335,371,000
Total	**$912,636,000**	**$323,661,000**	**$43,559,000**	**$67,846,000**	**$1,347,702,000**

Table 25. Category 3 Storm Surge using Maximum of MEOWs for the Town of Milford.

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Direct					
Building	$768,862,000	$83,999,000	$22,988,000	$9,943,000	$885,792,000
Contents	$639,318,000	$188,901,000	$43,063,000	$36,900,000	$908,182,000
Inventory	$0	$3,684,000	$5,647,000	$328,000	$9,659,000
Subtotal	$1,408,180,000	$276,584,000	$71,698,000	$47,171,000	$1,803,633,000
Business Interruption					
Income	$906,000	$112,176,000	$624,000	$10,729,000	$124,435,000
Relocation	$127,249,000	$30,253,000	$660,000	$5,418,000	$163,580,000
Rental Income	$49,504,000	$22,567,000	$99,000	$758,000	$72,928,000
Wage	$2,133,000	$117,203,000	$1,178,000	$42,616,000	$163,130,000
Subtotal	$179,792,000	$282,199,000	$2,561,000	$59,521,000	$524,073,000
Total	**$1,587,972,000**	**$558,783,000**	**$74,259,000**	**$106,692,000**	**$2,327,706,000**

Table 26. Category 4 Storm Surge using Maximum of MEOWs for the Town of Milford.

Milford	2022 Results				
	Residential	Commercial	Industrial	Other	Total
Direct					
Building	$1,238,120,000	$170,408,000	$39,456,000	$22,833,000	$1,470,817,000
Contents	$925,074,000	$332,144,000	$71,963,000	$58,168,000	$1,387,349,000
Inventory	$0	$7,196,000	$9,691,000	$585,000	$17,472,000

Milford	2022 Results				
	Residential	**Commercial**	**Industrial**	**Other**	**Total**
Subtotal	$2,163,194,000	$509,748,000	$121,110,000	$81,586,000	$2,875,638,000
Business Interruption					
Income	$1,682,000	$180,248,000	$962,000	$16,673,000	$199,565,000
Relocation	$178,133,000	$52,566,000	$1,028,000	$8,607,000	$240,334,000
Rental Income	$69,740,000	$39,553,000	$169,000	$1,141,000	$110,603,000
Wage	$3,956,000	$192,832,000	$1,820,000	$67,104,000	$265,712,000
Subtotal	$253,511,000	$465,199,000	$3,979,000	$93,525,000	$816,214,000
Total	**$2,416,705,000**	**$974,947,000**	**$125,089,000**	**$175,111,000**	**$3,691,852,000**

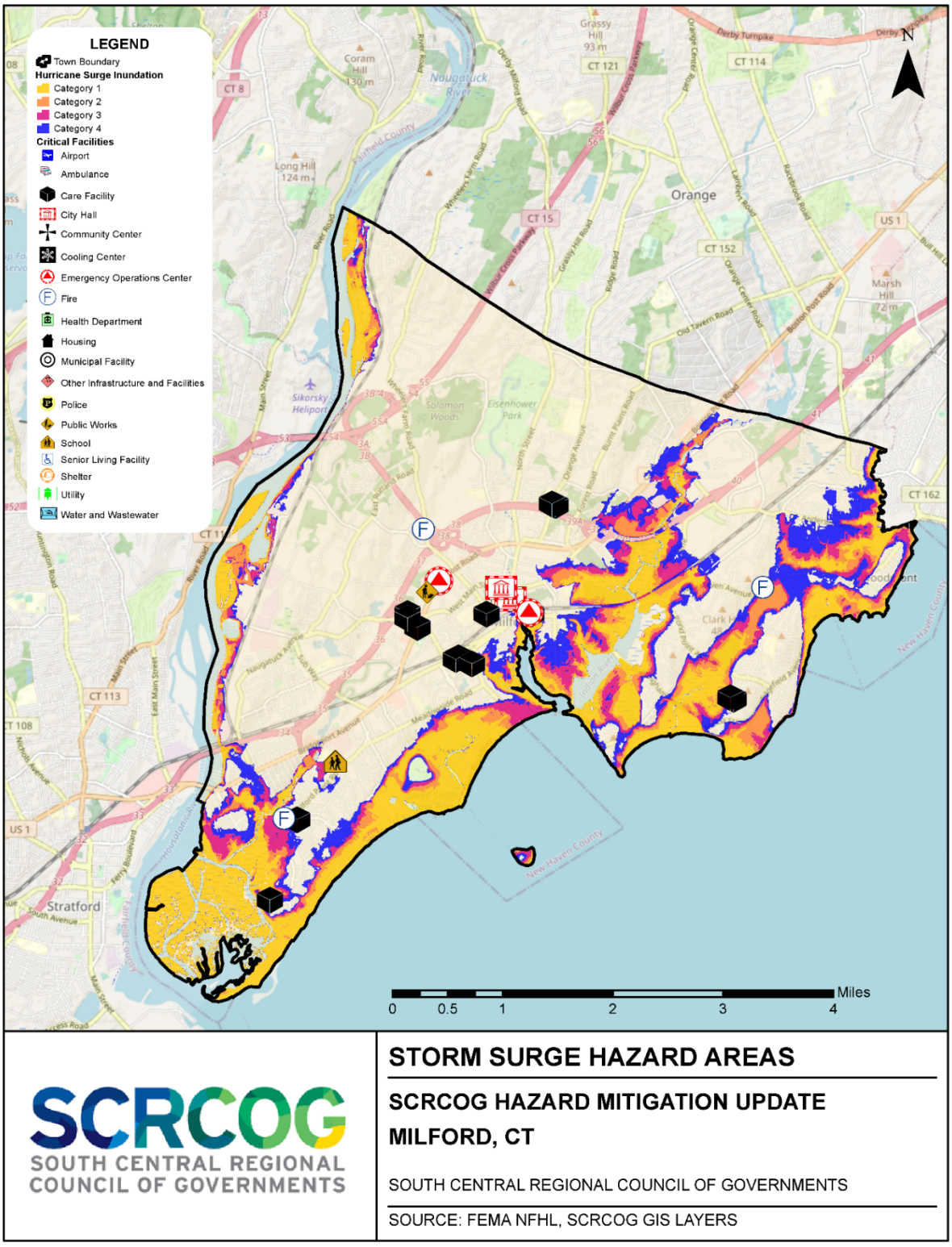

Figure 9. Storm Surge Hazard Areas in the Town of Milford, Connecticut.

3.5 Annualized Losses

Annualized loss estimates (

Table 27) have been developed for each hazard discussed in the regional hazard profiles. These estimates have been derived from a number of sources, including:

- Historic FEMA PA funds received by the community
- Historic FEMA IA funds received by property owners and renters
- Historic NFIP claims made within the community
- Connecticut State 2019 Hazard Mitigation Plan estimates
- HAZUS-MH modeling results performed for the region
- HAZUS-MH results from the Connecticut State 2019 Hazard Mitigation Plan

Table 27. Annualized Loss Estimates for the City of Milford.

Hazard	Source or Method	Losses in Milford	Years of Record	Annualized or Annual Loss
Coastal Erosion	Refer to Multi-Jurisdiction document	$2,000,000	---	---
Dam Failure	CT HMP NPDP	$2,042	1	$2,042
Drought	USDA	$0	10	$0
	CT HMP NCEI	$985	1	$985
Earthquake	FEMA P-366	$96,363	1	$96,363
Extreme Heat	None Available	$0	10	$0
Flood	PA	$443,422	10	$44,342
	NFIP	$76,129,100	44	$1,730,207
	IA (Sandy and Ida)	$2,992,950	10	$299,295
Hurricanes	FEMA PA	$2,509,071	10	$250,907
Severe Thunderstorm	NCEI direct calculation	$2,000	10	$200
	CT HMP NCEI	$3,196	1	$3,196
Severe Winter Storm	FEMA PA	$617,127	10	$61,713
	CT HMP NCEI	$10,830	1	$10,830
Tornado	FEMA PA	$0	10	$0

Hazard	Source or Method	Losses in Milford	Years of Record	Annualized or Annual Loss
	NCEI direct calculation	$0	10	$0
	CT HMP NCEI	$512,723	1	$512,723
Wildfire	CT HMP NFIC	$21,324	1	$21,324

3.6 Problem Statements

Problem statements were developed upon the completion and review of all risk assessment tasks. These statements are designed to briefly summarize the key hazard risks and vulnerabilities to the municipality based on potential impacts and losses from future events. They are among the issues of greatest concern and were used to assist in the identification and analysis of potential mitigation actions for. These problem statements will be reviewed and revised as needed during future plan updates to reflect the most current information resulting from the risk assessment.

Table 28. Milford Problem Statements.

Problem Area	Description
Primary Hazards of Concern	
Trees	Trees – Falling trees/branches are a significant hazard of concern, particularly as it relates to blocking roads and causing power outages. Ash trees is one of many tree concerns. Milford had 600 ash trees, and 300 remain to deal with. Milford represents and aging tree canopy. The City's ~~our~~ aging urban tree inventory is an additional potential threat. Beech Leaf disease is starting to spread and is killing trees will impact 115-120 trees on ROWs.
Fire	Phragmites creates a fire hazard behind residences.
Flooding	Flooding is primary hazard, with most vulnerable structures being residential building types located in SFHAs including coastal high hazard areas (velocity zones). More than one-third of the city is located within a mapped SFHA. Hurricane storm surge and high velocity wave action is the chief concern and has resulted in the extensive damage and destruction of many coastal properties in the recent past (Irene, Sandy). Inland areas along rivers and streams are also experiencing more flooding with more frequent short duration high intensity rain events (Isaias (2020) Elsa, Ida, Henri (2021). The built

Problem Area	Description
	environment along the shoreline has changed due to recovery efforts from past storms.
Hurricanes, Tropical Storms, and Nor'easters	Coastal storms including hurricanes, tropical storms, and nor'easters are also of high concern, as these events have the potential to cause major and widespread damage to the entire community with both flooding and high wind hazards.
Sea Level Rise	Sea level rise is a growing concern due to the fact it will increase the frequency and severity of existing coastal erosion and flood hazards.
Snowstorms	Roof collapses were noted as a significant danger during snowstorms.
Geographic Areas of Concern	
Coastal Areas and Wepawaug River	Residential structures that are subject to flooding during significant flood events are primarily in the southern section of the City and are impacted by coastal flooding. There is a mix of the types of homes in the hazard areas, but those at risk are primarily single-family dwellings. Most homes are year-round not seasonal. Flooding along the Wepawaug River which bisects the city and along smaller streams and brooks have also become a concern (Stubby Plain Brook and Tumble Brook).
Houses along the immediate shoreline.	Many homes are in the City's coastal high hazard area (velocity zone) are summer cottages that have been converted to year-round dwellings. This results in Milford's most highly dense residential neighborhoods being the most vulnerable. Over 100 homes have been elevated since Irene and Sandy. • Elevated homes create a new vulnerability for homes that are not elevated; those homes are now susceptible to flooding because the physical barrier of homes in front of them no longer exists. • Elevated houses also present new, unknown challenges in terms of wind resistance. We do not know if the building code is as effective when a house is raised 10-15 feet off the ground. A study was conducted by UConn to examine the effect of wind on elevated structures. • Elevated houses have a different risk for fire. A house fire of an elevated home on Melba St presented a new challenge for city firefighters as the air moved differently underneath the open space under the home and the proximity of elevated houses on either side of the burning structure also caught on fire.

Problem Area	Description
	Elevated houses no longer block sand and waves from washing into the streets. Wind, rain, and high tide events now deposit large quantities of sand into City streets. This requires hours for DPW crews to clean-up and disposal fees for sand and misc. yard debris. Sand and debris can compromise drainage infrastructure prolonging flooding.
Beaches	Beach areas subject to coastal flooding include the following: • Cedar Beach - Milford Point to the intersection of Milford Point Road and Seaview Avenue • Laurel Beach - Milford Point Road / Seaview Avenue to Wildermere Avenue • Wildermere Beach - Wildermere Avenue to Stowe Avenue • Walnut Beach - Stowe Avenue to Nettleton Avenue extended • Silver Beach - Silver Sands Parkway to Surf Avenue • Fort Trumbull Beach - Surf Avenue to Rogers Avenue • Gulf Beach - Milford Harbor to Point Lookout • Bayview Beach - Point Lookout to Calf Pen Meadow Creek • Pond Point Beach –Bayview Beach (Melba Street) - Calf Pen Meadow Creek to Buckingham Avenue • Point Beach - Buckingham Avenue to Hilldale Court • Morningside Beach - Hilldale Court to South Street • Farview Beach (Hillside Area) - South Street to Seabreeze / Merwin Avenue, Benjamin Street • Anchor Beach - Benjamin Street to Beach Avenue • Middle Beach -Woodmont Beach- Beach Avenue to West Haven Line
Tidal Areas	Areas that experience recurring tidal flooding include: • Laurel Beach by Milford Point Road, • The Silver Sands Area at East Broadway into Great Creak Area on the Great Creek Marsh side of homes. • Along Lawrence Court, Field Court, and Bayshore Drive areas • areas along Calf Pen Meadow Creek – particularly Melba St and Beachland Avenue, The Coastal Resilience Plan addresses the dead-end finger streets off East Broadway. Most often the homes toward the end of the street have implemented mitigation measures and the homes in the middle have not.

Problem Area	Description
Commercial Areas	Areas of commercial properties at risk to flooding: • Downtown/Milford Harbor Area • Wepawaug River (North of I-95 south to Route 1) • North side of Bridgeport Ave (between School House Road & Silver Sands Parkway) • New Haven Avenue businesses adjacent to Gulf Pond outlet/Pond Point Avenue • 750 & 772 Bridgeport Avenue • Boston Post Road from Red Bush Lane to 70 Turnpike Square. • Intersection of Boston Post Road and Woodruff Road • Rowe Ave – Metro North Drainage
Platt Street/Point Beach	Platt Street/Point Beach – experiences flooding
Trumbull Avenue	Trumbull Avenue Revetment
Indian River	Indian River/between Downtown and Pond Point Avenue
Downtown Milford	CIRCA's Resilient Connecticut program identified downtown Milford as a climate adaptation and resilience opportunity area due to the potential for flooding to increase the risks to TOD, regional assets like the MetroNorth station, and numerous community assets.
Devon	CIRCA's Resilient Connecticut program identified Devon as a climate adaptation and resilience opportunity area due to the potential for flooding to increase the risks to TOD, regional assets like the MetroNorth rail line, and numerous community assets along Bridgeport Avenue.
Walnut Beach area	CIRCA's Resilient Connecticut program identified the Walnut Beach neighborhood as a climate adaptation and resilience opportunity area due to the potential for flooding and extreme heat to increase the risks to existing multi-family housing (apartments, condos, affordable housing, and other housing).
Point Beach area	CIRCA's Resilient Connecticut program identified the Point Beach neighborhood as a climate adaptation and resilience opportunity area due to the potential for flooding to increase the risks to existing multi-family housing (apartments,

Problem Area	Description
	condos, affordable housing, and other housing).
Wildemere Beach	Beach nourishment and dune ridge designs for Wildemere beach have stalled due to permitting challenges. Additional efforts may be desirable in the next few years.
Route 1	Flooding of commercial properties northeast of downtown Milford along Route 1 has increased in recent years. Two specific areas associated with small streams in culverts, re-routed decades ago for commercial development, need to be addressed through improved conveyance and reduction of stormwater runoff. These areas are generally from Red Bush Lane to the Orange town line. Flooding also occurs on Route 1 at Schoolhouse Road adjacent to the Milvon Power substation.
Vulnerable Community Assets	
Assets Vulnerable to Hurricane Surge	Nearly $1 billion in city infrastructure is at risk to hurricane storm surge (up to Category 4) including an animal shelter, two wastewater treatment plants, an elementary school, and a middle school.
Beaverbrook Wastewater Treatment Facility	The City's Beaverbrook Wastewater Treatment facility is at risk to flooding. Beaverbrook serves as a secondary treatment facility that augments the main Housatonic Wastewater Treatment facility, serving approximately 14,000 of Milford's 54,000 residents, including the City's primary shelter which is Jonathan Law High School. The City has previously considered a FEMA grant to construct a berm around the plant with a 25% match from the City, but this approach has stalled. Renewed interest may occur from CIRCA's Resilient Connecticut program, given that Resilient Connecticut identified the WWTP as a climate adaptation and resilience opportunity area due to the potential for flooding adversely affecting a critical utility.
Roofs	All 14 of Milford's schools, both wastewater treatment plants, the City Library, Police Station, City Hall, Parson's Government Center, and the Public Works Complex all have flat roofs and are considered susceptible to collapse under heavy snow loads. Many businesses in the city also have flat roofs. All the schools have received new roofs and some are getting new windows. The Parsons Government complex also had a portion of its roof replaced in 2017.

Problem Area	Description
Communication & Data	The city offices are also now on a fiber optic network and the financial management system is cloud based for resiliency.
Schick Razor Company	Schick Razor Company experiences repeated flooding.
Connecticut Post Mall	Connecticut Post Mall experiences flooding.
Jonathan Law High School	The Jonathan Law High School is the primary shelter, and it has a generator powered by natural gas.
Animal Shelter	Animal Shelter – vulnerable to flooding and may become an island, pets are evacuated prior to flooding to Orange.
Tri Beach and the Margret Egan Recreation Centers	Tri Beach and the Margret Egan Recreation Centers are vulnerable to flooding
Sewer pump stations	A number of sewer pump stations are at risk for storm water inundation, putting their electrical systems in danger. Where possible these pump stations should be elevated and protected. Separately, some pump station generators are more than 50-60 years old, and parts are no longer available to service them. These generators need to be replaced and elevated.

4. Capabilities

The City of Milford is a developed shoreline community with high capabilities and resources to support the implementation of hazard mitigation actions. This jurisdictional annex provides some additional documentation on the existing local authorities, policies, programs, and resources to support mitigation and the City's ability to enhance or build upon these existing capabilities. This includes more detailed information on the updated capability findings for the community as highlighted in Chapter 6 (Capability Assessment), as well as the identification of some specific opportunities to expand and improve local mitigation capabilities for consideration as potential new actions for Chapter 7 (Mitigation Strategy).

4.1 Summary of Local Findings

4.1.1 Planning and Regulatory Capabilities

Planning and regulatory capabilities include the local plans, policies, codes, and ordinances that are relevant to reducing the potential impacts of hazards. The following planning and regulatory capabilities are currently in place for Milford:

- Comprehensive/Master Plan (Plan of Conservation and Development)
- Capital Improvements Plan
- Local Emergency Operations Plan
- Transportation Plan
- Stormwater Management Plan
- Disaster Recovery Plan
- Coastal Zone Management Plan
- Climate Change Adaptation Plan
- Coastal Resilience Plan
- Building Codes Adequately Enforced
- Zoning Ordinance Adequately Enforced
- Land Use Planning
- Zoning Ordinance
- Subdivision Ordinance
- Acquisition of Land for Open Space & Recreation

Given their direct relevance and significance to long-term hazard risk reduction, all current versions of formally adopted POCDs for participating jurisdictions were reviewed during the plan update process to ensure general consistency and integration as appropriate. Content from the City of Milford's POCD that is particularly relevant to this hazard mitigation plan is detailed below and hereby incorporated by reference. Additional information on how adequately the POCD and related planning tools are being

used for hazard mitigation purposes can be found under the Safe Growth Survey section of this annex (see Section 4.2).

Milford – 2022: Plan of Conservation and Development, Milford, Connecticut (2012)

- In discussing future land use trends in the Land Use element, the plan notes how Milford's shoreline is changing and being redeveloped due to natural and destructive events and that the "rate of this redevelopment will increase as sea levels continue to rise, flood zones expand, and more extensive damage occurs from smaller weather events that previously did not damage property." (p. 19)
- In the Coastal Resources and Long Island Sound element, the plan identifies "Flood Hazards" as the most significant and common natural hazard for the city. It goes on to describe how its geography, topography, and development history have made it a flood prone community with some of the city's highest density neighborhoods being the most vulnerable to storm event flooding. (p. 44-47)
- The plan includes a dedicated section on "Sea Level Rise," noting that increased sea levels are expected to result in more flooding and increased height of storm surge for coastal cities such as Milford (p. 51), and that the City should "analyze the benefits and costs of a retreat policy" (p. 52) This increased risk is also addressed in the Action Plan, calling for the City to "Assess the City's Sea Level Rise impacts and risks and develop and Climate Adaptation Plan." (p. 148)
- The Action Plan makes a direct linkage to the hazard mitigation plan by stating "Per the City's Hazard Mitigation Plan, continue to institute hazard mitigation policies where possible, particularly where related to reducing flood hazards, including grant applications for elevation and acquisition." (p. 148)

Fortunately, as evidenced above, the City of Milford has some other important mitigation capabilities in place that work in conjunction with the POCD to reduce hazard risk. This includes the adoption and enforcement of building codes and land use and development ordinances/regulations that support mitigation by ensuring new or substantially improved development projects meet specific standards for public safety and protection from natural hazards. Among these regulations are specific flood hazard regulations and coastal site plan reviews that are critical for development along Milford's extensive shoreline. The administration and enforcement of these codes and development regulations are considered among the most effective and cost-beneficial measures to protect people and future development from the impact of natural hazard events. Some additional information on how effectively these regulatory tools and methods are being used for hazard mitigation purposes can be found in the Safe Growth Survey and NFIP Participation and Compliance sections of this annex. Some specific opportunities to enhance these tools are identified at the end of this Capabilities annex.

4.1.2 Administrative and Technical Capabilities

Administrative and technical capabilities include the local human resources and their skills/tools that can be used to support mitigation activities. The following administrative and technical capabilities are in place for Milford:

- Planning Commission
- Maintenance Programs to Reduce Risk
- Mutual Aid Agreements
- Chief Building Official
- Floodplain Manager
- Emergency Manager
- Community Planner
- Civil Engineer
- GIS Coordinator
- Warning Systems
- Hazard Data
- Hazus Analysis

The City of Milford has strong administrative and technical capabilities spanning across many departments under the general supervision of the Mayor. Key departments as it relates to hazard mitigation and long-term risk reduction to natural hazards include Permitting and Land Use (which includes the Planning and Zoning Office and Building Inspection), Public Works (including Building Maintenance, Engineering, and Highway/Parks), Open Space and Sustainability, and Emergency Management Services. City staff are supported by other community members who are appointed to local boards and commissions which goes a long way in supporting local administrative capabilities and technical expertise. Relevant examples include the Flood and Erosion Control Board, the Inland Wetlands Agency, the Harbor Management Commission, and the Park, Beach, and Recreation Commission.

Despite these capabilities and resources, City staff expressed concern with regards to progress with hazard mitigation activities and compliance with the NFIP and goals of the CRS program. Documentation and record-keeping procedures were noted as something the City needs to invest more staff time in (for example, maintaining elevation certificates), but existing resources are stretched with other daily functions. However, the City continues to do well in terms of other routine mitigation measures, such as maintaining and clearing catch basins across the community to reduce potential flooding impacts.

4.1.3 Financial Capabilities

Financial capabilities include the fiscal resources the community has access to for helping to fund the implementation of hazard mitigation projects and related risk reduction activities. The following financial capabilities are in place for Milford:

- Capital improvement project funding
- Authority to levy taxes for specific purposes
- Fees for water, sewer, gas, or electric services
- Impact fees for development
- Community Development Block Grant
- Federal Funding
- State Funding

The City of Milford indicated that funding is among their biggest constraints in terms of completing hazard mitigation projects. The City has been successful in implementing past projects due to the widespread availability of external funding support (e.g., post-disaster mitigation funding following major Tropical Storm Irene, Hurricane Sandy, etc.). City staff indicated they still have shovel-ready projects to implement but don't have the ability to fund most of this work without outside assistance. In the past Milford has used a Grants Committee that works to identify grants specifically for hazard mitigation and emergency management, and this is something that will be revisited as part of the updated Mitigation Strategy.

4.1.4 Education and Outreach Capabilities

Education and outreach capabilities include the local programs and methods already in place that can be used to support mitigation activities. The following education and outreach capabilities are in place for Milford:

- CERT Team
- Public Education Program
- Natural Disaster Program in Schools
- Public-Private Partnership for Disaster Issues
- Website
- Email Listserv
- Social Media
- Reverse 911 / Flood Warning System
- Milford Government Access Television

The City has been very active is using social media to help with community outreach and public education efforts, especially through the Covid-19 pandemic when in-person methods were not being used. However, City staff noted that conducting effective public engagement has long been an issue in need of improvement, and new methods are continuing to be explored for a variety of campaigns. Public outreach on emergency preparedness and hazard mitigation was identified as something that is constantly needed, including through more targeted outreach efforts (for example, to new residents who may not be familiar with the city's coastal/flood hazards).

4.2 Safe Growth Survey

As introduced and described in Chapter 6 (Capability Assessment), the Safe Growth Survey was used again during the plan update process to help evaluate the extent to which the City of Milford is positioned to grow safely relative to its natural hazards. The survey covered six topic areas including the following:

- Land Use
- Transportation
- Environmental Management
- Public Safety
- Zoning Ordinance
- Subdivision Regulations
- Capital Improvement Program and Infrastructure Policies

The results of the Safe Growth Survey are summarized in Table 29. This includes describing how strongly current City staff agrees or disagrees with 25 statements as they relate to existing plans, policies, and programs for guiding future community growth and development, according to the following scale:

1=Strongly Disagree 2=Somewhat Disagree 3=Neutral 4=Somewhat Agree 5=Strongly Agree

Survey results provide some helpful information on how effective existing planning mechanisms are currently being used to address hazard mitigation and long-term risk reduction. The results were also incorporated into the analysis of possible new mitigation actions for the City of Milford to consider in terms improving or expanding upon its planning and regulatory capabilities to reduce the effects of natural hazards, including but not limited to the vulnerabilities identified in the risk assessment.

Table 29. Safe Growth Survey Results, City of Milford.

COMPREHENSIVE/MASTER PLAN *(i.e., Plan of Conservation and Development)*					
Land Use					
1. The comprehensive/master plan includes a future land use map that clearly identifies natural hazard areas.	1	2	3	4	**5**
2. Current land use policies discourage development and/or redevelopment within natural hazard areas.	1	**2**	3	4	5

COMPREHENSIVE/MASTER PLAN *(i.e., Plan of Conservation and Development)*						
3.	The comprehensive/master plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	1	2	3	**4**	5
Transportation						
4.	The transportation element limits access to natural hazard areas.	1	2	**3**	4	5
5.	Transportation policy is used to guide future growth and development to safe locations.	**1**	2	3	4	5
6.	Transportation systems are designed to function under disaster conditions (e.g., evacuation, mobility for fire/rescue apparatus, etc.).	1	**2**	3	4	5
Environmental Management						
7.	Environmental features that serve to protect development from hazards (e.g., wetlands, riparian buffers, etc.) are identified and mapped.	1	2	3	4	**5**
8.	Environmental policies encourage the preservation and restoration of protective ecosystems.	1	2	**3**	4	5
9.	Environmental policies provide incentives to development that is located outside of protective ecosystems.	**1**	2	3	4	5
Public Safety						
10.	The goals and policies of the comprehensive/master plan are related to and consistent with those in the hazard mitigation plan.	1	2	**3**	4	5

COMPREHENSIVE/MASTER PLAN *(i.e., Plan of Conservation and Development)*						
11.	Public safety is explicitly included in the comprehensive/master plan's growth and development policies.	1	2	**3**	4	5
12.	The monitoring and implementation section of the comprehensive/master plan covers safe growth objectives.	1	**2**	3	4	5
ZONING BYLAWS						
13.	The zoning bylaws conform to the comprehensive/master plan in terms of discouraging development and/or redevelopment within natural hazard areas.	**1**	2	3	4	5
14.	The bylaws contain natural hazard overlay zones that set conditions for land use within such zones.	**1**	2	3	4	5
15.	Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	1	**2**	3	4	5
16.	The bylaws prohibit development within, or filling of, wetlands, floodways, and floodplains.	**1**	2	3	4	5
SUBDIVISION REGULATIONS						
17.	The subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas.	**1**	2	3	4	5
18.	The regulations provide for conservation subdivisions or cluster subdivisions to conserve environmental resources.	1	2	3	4	**5**
19.	The regulations allow density transfers where hazard areas exist.	**1**	2	3	4	5
CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES						

COMPREHENSIVE/MASTER PLAN *(i.e., Plan of Conservation and Development)*						
20.	The capital improvement program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	**1**	2	3	4	5
21.	Infrastructure policies limit the extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	1	2	**3**	4	5
22.	The capital improvements program provides funding for hazard mitigation projects identified in the hazard mitigation plan.	1	2	**3**	4	5
OTHER						
23.	Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	1	2	**3**	4	5
24.	The building code contains provisions to strengthen or elevate new or substantially improved construction to withstand hazard forces.	1	2	3	4	**5**
25.	Economic development and/or redevelopment strategies include provisions for mitigating natural hazards or otherwise enhancing social and economic resiliency to hazards.	**1**	2	3	4	5

4.3 NFIP Participation and Compliance

The City of Milford has actively participated in the National Flood Insurance Program (NFIP) since 1978. The current effective Flood Insurance Rate Map (FIRM) is dated May 16, 2017. As of August 31, 2022, there are a total of 2,152 NFIP policies in force. The total annual premium is $2,390,010 for a total of $568,787,300 in coverage. A total of 3,169 claims amounting to approximately $76,003,353 have been paid to NFIP policyholders in Milford since joining the program.[15] More information on NFIP-insured

[15] FEMA NFIP, HUDEX Report, Policy and Loss Data by Community: https://nfipservices.floodsmart.gov//reports-flood-insurance-data

structures, including those that have been repetitively damaged by floods, is provided in Chapter 5 (Risk Analysis).

Table 30 describes the City of Milford's participation and continued compliance in accordance with NFIP requirements and as specified in FEMA's 2022 Local Mitigation Planning Policy Guide.[16]

Table 30. NFIP Participation and Compliance, City of Milford.

REQUIRED INFORMATION	RESPONSE
Adoption of NFIP minimum floodplain management criteria via local regulation.	Adopted via Milford Zoning Regulations, Section 5.8: Flood Hazard and Flood Damage Prevention Regulations, Re-Adopted 3/22/19.
Adoption of the latest effective Flood Insurance Rate Map (FIRM), if applicable.	Adopted via the above Zoning Regulations (Section 5.8.2: Zoning Applicability). Latest effective FIRM is dated 5/16/2017.
Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs.	Permitting software identifies a property and structure of a building permit application or zoning permit application as being in the SFHA (floodplain), triggering enforcement of the Flood Hazard and Flood Damage Regulations cited above. Milford is formalizing it's zoning and building permit enforcement of floodplain regulations through a floodplain permitting processes and permits establishing construction document plan reviews and field inspections that are specific to enforcement of the NFIP requirements through the building code and zoning regulations.
Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP.	Joseph Griffith, Director, Floodplain Administrator
Description of how participants implement the substantial improvement/substantial damage	Analysis compares 85% of appraised value of structure to the proposed cost of construction plus cost of permitted work done in the past 5

[16] Local Mitigation Planning Policy Guide. FEMA. April 2022. P. 26.

REQUIRED INFORMATION	RESPONSE
provisions of their floodplain management regulations after an event.	years, to determine cumulative substantial improvement.

Milford's local floodplain management regulations and building code enforcement procedures include the following requirements that exceed minimum NFIP standards:

- Require freeboard (elevation requirements higher than the base flood)
- Require soil tests or engineered foundations
- Require compensatory storage for new developments
- Prohibit or enforce higher standards for critical facilities subject to flood hazards
- Provision for cumulative substantial damage/improvement requirements
- Provisions that protect natural and beneficial functions of floodplains

Milford Zoning Regulations Section 5.8.16 requires compensatory storage when providing any fill in the floodplain, and Section 5.8.13 and requires a Design Flood Elevation (DFE) of 2 feet above the Base Flood Elevation (BFE). Milford has also adopted a program of encouraging ground floor/garage floor on new construction on streets subject to flooding, to be raised 1'6" above the existing street elevation to allow for future elevation of the street.

The City of Milford joined the CRS Program in 2012 and currently participates as a Class 9 community. As an active CRS community City staff have the support of the Board of Aldermen and Mayor's office with no identified impediments to running an effective NFIP program in Milford. The City completed its last NFIP Community Assistance Visit on September 25, 2018.

Additional information on each jurisdiction's floodplain management program and participation in the NFIP is provided in Chapter 6 (Capability Assessment).

Improvement Opportunities

Although the City of Milford has relatively high capabilities and is well-positioned to mitigate the natural hazard risks faced by the community, it can expand and improve on the capabilities described in Chapter 6 (Capability Assessment) and this annex. The City is aware of each it's strengths and weaknesses in terms of mitigating risk. Specific opportunities to address existing gaps or limitations in local capabilities to reduce risk have been identified for each capability type and are further described below. Each of these opportunities were then considered by the City during the plan update process as potential new mitigation actions to be included in the updated Mitigation Strategy.

Planning and Regulatory Capabilities

- Conduct a detailed assessment of all relevant zoning bylaws, land use regulations, and the City's permit review process to identify the amendments/improvements needed to better address natural hazards, climate change, and projected future conditions (including coastal vulnerability but also extreme heat, heavy downpour events, etc.). This includes the incorporation of nature-based solutions such as living shorelines, low impact development, and other green infrastructure techniques into existing rules and regulations where most appropriate.
- Increase the integration of hazard mitigation and climate resiliency into the City's existing CIP planning and project lists. Examples include (1) making resilience a key objective/priority for the City's strategic, operational, and fiscal policies for municipal infrastructure and asset management; and (2) developing methods to help ensure the City limits expenditures on projects or infrastructure improvements that would encourage development and/or redevelopment in areas at high risk to natural hazards.
- Be opportunistic with further incorporating hazard mitigation and resilience into the City's updated POCD (draft plan update underway), especially as it relates to land use policies that will discourage development and/or redevelopment within natural hazard areas and transportation or environmental policies that can reduce risk and/or provide incentives to infrastructure and development that is located outside of hazard areas or protective ecosystems.
- Coordinate between to align the City's economic development goals and strategies with long-term community resilience.

Administrative and Technical Capabilities

- Develop systems or practices that can help the City to better cope with staff turnover or other disruptions to routine government functions and duties that support risk reduction.
- Develop central tracking system to decrease staff burdens and facilitate improved coordination between departments on floodplain management activities, pre-disaster mitigation/resiliency-themed projects, or other routine maintenance activities as well as emergency preparedness and response operations. Special emphasis should be placed on improving the documentation and record-keeping practices for compliance with the City's CRS program as required by FEMA and ISO.
- Increase current staff capacity to pursue and implement hazard mitigation, climate adaptation, and other community resilience building activities through professional development opportunities and making additional staff hires as determined necessary.
- Build internal staff capacity to identify and pursue external sources of grant funding for mitigation projects through increased opportunities for training/professional development and the ability to invest more time on grant writing, grants management, and related administrative tasks. Consider the designation or hiring of a dedicated resource development / grants administrator for the City.

Financial Capabilities

- Maximize opportunities through the City's budgeting and CIP process to help fund priority hazard mitigation and climate adaptation projects, especially when a local cost-share increases the City's chances for a grant award.
- Consider reinstituting the City's previous Grants Committee to help identify external sources of funding that are available specifically for implementing the City's priority hazard mitigation, climate adaptation, and emergency management-related projects.
- Continue to coordinate with SCRCOG and neighboring communities in the region as it relates to positioning the City to pursue and capture future grant funding for regional hazard risk reduction projects.

Education and Outreach Capabilities

- Continue to explore new methods and processes for improving the City's outreach and engagement with the public, particularly through in-person events across the community.
- Increase use of the City's website to support low-cost public education and outreach initiatives on building community resilience to hazards as well as individual mitigation actions for homeowners, business owners, etc.
- Expand opportunities for public/private partnerships to support public education and community outreach initiatives related to hazard awareness and risk reduction efforts.
- Identify and seek to address any unmet needs related to targeted outreach and education for the community's more vulnerable populations (i.e., environmental justice communities, residents with special needs, property owners in high risk hazard areas, new residents who are unfamiliar with Milford's coastal hazards, etc.).
- Consider the development of a formal Program for Public Information (PPI) in support of the City's ongoing education and outreach activities for the CRS program under Activity 330.

Possible New Actions Related to NFIP Participation and Compliance

- Coordinate with the State NFIP Coordinator on possible updates or revisions to local floodplain management regulations based on CT DEEP's most current Model Floodplain Management Regulations (which are routinely being updated as needed).
- Maintain digital FEMA elevation certificates for all construction in the floodplain.
- Evaluate and consider the adoption of "higher standards" that are proven to reduce flood damage such as those described under Question #3 (especially freeboard, setbacks, limitations on lower-level enclosure size, and the prohibition on use of fill).
- Evaluate current floodplain management activities and coordinate with Insurance Services Office, Inc. to apply for participation in FEMA's Community Rating System (CRS).
- Evaluate permit application forms to determine possible modifications focused on flood hazard prevention. Develop a checklist for review of building/development permit plans and for inspection of development in floodplains (a model is available).

- Establish a goal to have each plan reviewer and building inspector attend a related training periodically (for example, ASFPM's Annual National Conference, chapter conferences, webinars, etc.).
- Sponsor a periodic NFIP workshop for local surveyors and builders.
- Encourage or require certain local staff positions to obtain and maintain Certified Floodplain Manager (CFM) certification.
- Maintain a map of areas that flood frequently (e.g., areas where repetitive loss properties are located) and prioritize those areas for inspection immediately after the next flood. If outside FEMA special flood hazard areas, consider requiring existing NFIP regulatory standards (compliance with existing ordinance) through overlay zoning, etc.
- Hold informative work sessions for newly elected officials and new appointees to planning commissions and appeals/variance boards, to provide an overview of floodplain management, the importance of participating in the NFIP, and the implications of failing to enforce the requirements of the program or failing to properly handle variance requests.
- Develop a local Post-Disaster Substantial Damage Plan to assist with implementing substantial damage provisions of the NFIP, the State Building Code, and local floodplain regulations (guidance available).
- Obtain FEMA's Substantial Damage Estimator and attend training to be prepared to use it when damage occurs; develop mutual aid agreements with other jurisdictions to augment local inspection personnel after major disasters.
- Conduct a review of other regulatory programs and planning tools, such as the comprehensive plan and zoning ordinance, and report on opportunities to improve consistency with the objectives of floodplain management.
- Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage. Make available in public buildings, local library, website, etc. and inform people who they can call to learn more information.
- Send information about the flood hazard and promote the availability of flood insurance through regularly scheduled mailings (such as the dissemination of handouts with annual property tax notices, utility bills, etc.).
- Develop handouts for permit applications on specific issues such as installation of manufactured homes in flood hazard areas according to HUD's installation standards (examples available), or guidance on improving/repairing existing buildings to better withstand potential hazards.

5. Mitigation Actions

Mitigation actions are projects or activities identified to reduce current and future vulnerabilities identified through the process of developing this 2023 SCRCOG Mitigation Plan Update. The first table in this section identifies the status of the mitigation actions included in the 2016 version of this plan. Besides current status, actions brought forward to this 2023 plan are identified in the Keep for Plan Update? column. The second table includes all the actions, and their essential details, for this 2023 SCRCOG Mitigation Plan Update. The actions are also listed in the Mitigation Action Tracker (a Google Sheet spreadsheet) maintained by SCRCOG. These actions were prioritized by the Municipality according to the criteria detailed in the main body of the plan.

Table 31. Status of Previous Mitigation Actions – City of Milford.

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
1	300 KW Fuel Cell-Housatonic WWTP	Provide continuing heat and power supply to sewage treatment plant.	Completed	Completed and operational. BOA authorized 3/4/19. Bloom Energy is contractor. Project utility performance benefit under review.	NO (see explanation at left)
2	Annual Survey and Monitoring for Woodmont Beach (required by ACOE)	Woodmont Beach study and investigate erosion control, repair/replacement of shoreline storm drains and sand replenishment. This amount will be used to fund the study only.	Completed + To Be Continued	The City will continue to perform this action and submit reports to ACOE and Borough of Woodmont as required. Now a capability versus mitigation action.	NO (see explanation at left)
3	Wepawaug River Pond Dredging/Dam and Shore Rehabilitation	Dredge Wepawaug River Ponds (North St. (upper) Duck Pond, City Hall (lower) Duck Pond, and Prospect Street Pond). Repair dams and shore walls. The ponds have been filled with	Completed	Dredging of Wepawaug River Ponds completed 11/2018 (North St. Pond, City Hall Pond, and Prospect Street Pond). Restored North St. and City Hall pond walls. Maintenance for 3 lower	NO (see explanation at left)

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
		silt and debris which threatens wildlife and habitats. Lack of sediment storage behind dams is causing siltation of the harbor requiring frequent dredging. Dredging, dam and shore repair has not been done in several decades.		ponds identified as new action for plan update.	
4	Gulf Beach	Gulf Beach maintenance and sand replenishment as needed.	Completed + To Be Continued	Completed and should continue be completed on an annual (seasonal) basis. Now a capability versus mitigation action.	NO (see explanation at left)
5	Milford Harbor	Dredging of Milford's Inner Harbor, Federal Channel, and Federal Anchorage.	Partially Completed / In Progress	USACE anticipates solicitation going out late spring/early summer 2023 for dredging in the winter season of 2023/2024.	YES (see Action #1)
6	Walnut /Wildemere Beach (CRP Action WW3)	Coastal resiliency plan and permitting project for sand replenishment and outfall replacement /repair.	Partially Completed / In Progress	Planning study completed 3/30/19. Permits not issued at this time. Requesting proposal from GEI/SLR to assist City to continue support for permitting. Project requires CT DEEP, USACE and USFWS review.	YES (see Action #2)
7	Gulf Street & Welchs Point Road Bluff Stabilization	The natural earth bluff was eroded by Superstorm Sandy. If it continues to erode, it will expose the underground utilities and endanger the asphalt road. Planning and permitting project only.	Partially Completed / In Progress	The City received CDBG-DR funding for design and permitting. Design plans are approximately 90% completed but still require construction level plans and bid specifications to be created. The City already has permits from CT DEEP and	YES (see Actions #3-4)

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
				USACE. Project implementation identified as a new/separate mitigation action but is contingent upon funding.	
8	Bayview Beach Area Flooding Study and Drainage Improvements (CRP Action BB2)	Bayview Beach Area Flooding Study and Drainage Improvements in the area of Field Court. The proposed planning, permitting, and construction project will mitigate flooding dangers in the area and provide safer access through the streets.	Partially Completed / In Progress	Drainage improvements have been completed. Working to secure two (2) portable pumps for use in event dune is overtopped.	YES (see Action #5)
9	Beachland Avenue Road Elevation (CRP Action MC3)	Elevate the lower portion of Beachland Avenue to mitigate flooding.	Partially Completed / In Progress	Items remaining: invasive Phragmites monitoring and treatment; planting of roadside salt tolerant seed mixtures. Now a capability versus mitigation action.	NO (see explanation at left)
10	Crescent Beach Resiliency (CRP Action BW2 and BW3)	Analysis of resiliency options for the Woodmont Crescent Beach. The proposed project is a three-part project that will include a survey and analysis of Crescent Beach and the surrounding area, a planning stage, and a final design stage. Grant # 6206, Expiration 2/28/2019.	Partially Completed / In Progress	USACE permits received with conditions. Planning study completed 3/30/19. Final USACE permits and conditions to be confirmed. Needs to be reviewed with the FECB. Funding to be determined.	YES (see Action #6)
11	Pelham Street (Bay Street-paper street) Public Access	Analysis of resiliency options to stabilize bluff and protect public access at the base of the Bay Street	Partially Completed / In Progress	Planning study completed 3/30/19. 40% design plans reviewed with DEEP, prior	YES (see Action #7)

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
	Resiliency (CRP Action MC6 and MC7)	(paper street). Planning and permitting project only.		to DEEP permitting. Final DEEP COP Permit required.	
12	Eisenhower Park Pond - Wepawaug River Dredging/Dam Spillway Rehabilitation	Dredge Wepawaug River Pond at Eisenhower Park. Repair dams and shore walls. The pond has been filled with silt and debris which threatens wildlife and habitats. Dredging, dam and spillway repair has not been done in several decades.	Delayed	Action being carried forward as Maintenance Assessment.	YES (see Action #8)
13	Gulf Beach Breakwater (CRP Action GB-1)	Design Plan, Permitting and construction of a stone breakwater to protect Gulf Beach from sand erosion and sediment accumulation in Milford Harbor.	Delayed	Additional design required for the planning project revisions to respond to permitting requirements.	YES (see Action #9)
14	Morningside Bluff, Seawall and Revetment (CRP Action MH1 and MH2)	Repair of Morningside revetment to protect Morningside Drive and infrastructure. Construction of a seawall to stabilize the eroding bluff.	Partially Completed / In Progress	CDBG-DR funding received for revetment construction; completed in November 2022 ($100,000). Funding TBD for additional work (additional seawall repairs).	YES (see Action #10)
15	Beaver Brook WWTP Flood Control Project (CRP Action SS1)	WWTP processes 25% of the City's Sewage and portions of the facility are located in the zone AE (10). Proposal to protect the infrastructure and functioning of the plant.	Delayed	Project delayed but will be kept as an action for plan update.	YES (see Action #11)
16	Pump Station Flood Mitigation	Milford has 40 pump stations for its sanitary sewer system. Pump stations to be reviewed to enhance	Partially Completed / In Progress	ARPA Funding received for 6 pump stations which are in progress and	YES (see Action #35)

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
		equipment for improving resiliency. Planning and permitting project only.		identified as new actions for the plan update.	
17	Microgrid Project	To provide power resilience to Parsons Government Center, City Hall, Harborside Middle School, Federal Senior Housing, and Milford Senior Center facilities in the event of a power loss.	Completed	Now just working on project closeout and punch list. Expected to be done in March 2023.	NO (see explanation at left)
18	Milford Point Road Elevation Project (CRP Action MP-1)	The road elevation project will mitigate street flooding occurring during lunar tides and provide a pedestrian sidewalk and boardwalk section.	Delayed	The pedestrian sidewalk and boardwalk sections are being delayed pending additional funding (estimated $500,000 additional funds needed).	YES (see Action #12)
19	CIRCA Walnut Beach Dune Restoration Project (CRP Action WW6)	This project is managing invasive vegetation in the Walnut Beach Dune and restoring native dune plantings. This will enhance dune resilience, improve habitat and enhance aesthetics.	Completed + To Be Continued	Grant completed. Project continuing with volunteers and with UI & City donation. Ongoing maintenance of restored areas and assessment of additional areas to possibly manage. Now a capability versus mitigation action.	NO (see explanation at left)
20	NRCS Emergency Floodplain and Watershed Protection Program (EWP/FPE) (CRP Action PA1)	Conservation easement on 4 parcels of Milford Land Conservation Trust Land (approximately 10 acres) located in upper Calf Pen Meadow Marsh.	Partially Completed / In Progress	Final closing with NRCS and MCLT Feb 2022. NRCS will be doing 3 years of restoration and MLCT to continue maintenance. Now a capability versus mitigation action.	NO (see explanation at left)
21	Elevation of Sailors Lane Pump Station	Project to elevate the generator and equipment on Sailors Lane.	Completed	Completed Summer 2020. Additional upgrades to be completed as part of the	NO (see

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
				City's Pump Station Generator Resilience Project (new action for 2023 plan).	explanation at left)
22	Debris Management Site Acquisition	Proposed 10-acre industrial land adjacent to the City's Transfer site on Oronoque Road is being considered for purchase for disaster debris management.	Delayed	Previous identified site no longer available. Alternate sites to be assessed and recommended.	YES (see Action #13)
23	Eisenhower Park Environmental/Existing Renovations	Environmental reclamation, natural resource & recreational improvement, floodplain and water quality improvement, park maintenance and park security.	Partially Completed / In Progress	The Eisenhower stage is currently being designed by O'Riordan Migani Architects. Then it will be reviewed and sent out to bid. Trail assessment, maintenance, and improvements have continued in Eisenhower without the need for funding.	YES (see Action #14)
24	Flax Mill Lane Bridge Repair	Rehabilitation and repairs to the deck, piers and abutments to the Flax Mill Lane Bridge over the Wepawaug River. The bridge was constructed in 1935 and has been identified as requiring work to maintain its structural integrity and aesthetic charm.	Completed	Completed December 2020.	NO (see explanation at left)
25	Tumblebrook Flood Control Study	Commission study to control flooding along Tumblebrook which flows approximately 3,000 linear feet from the Orange town line to Route 1	Delayed	Still looking for possible funding source to support this study.	YES (see Action #15)

Action #	Action Title	Action Description	Current Status	Status Description/Explanation	Keep for Plan Update?
		(Boston Post Road). Watershed encompasses over 500 acres of densely developed and populated area. Flooding occurs in heavy rains affecting many homes and flooding on Route 1.			
26	City-Wide Flood Zone Warning System Upgrade	Flood gauge and flood warning system upgrades town wide.	Delayed	Still looking for possible funding source to support this study.	YES (see Action #16)
27	IT Infrastructure	Where appropriate and when available the City needs to upgrade IT, mapping, and communications infrastructure. This will give capabilities to mitigate and assess hazard risks and perform public outreach.	Partially Completed / In Progress	Just started project in November 2022.	YES (see Action #17)
28	Coastal Resiliency for Areas Outside Existing Resiliency Projects	Milford has approximately 17 miles of coastline. Many low-lying shoreline neighborhoods are prone to flooding and shoreline erosion. Some have benefited from resiliency projects. Others are undergoing study. This project would review the remaining areas.	Delayed	Still looking for possible funding source to support this study.	YES (see Action #18)

Table 32. Updated Mitigation Actions (2023-2028) – City of Milford.

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
1	Milford Harbor	Dredging of Milford's Inner Harbor, Federal Channel, and Federal Anchorage. USACE anticipates solicitation going out late spring/early summer 2023 for dredging in the winter season of 2023/2024.	$7,000,000	ACOE funding	ACOE-Harbor Master -Harbor Commission	USACE anticipates solicitation going out late spring/early summer 2023 for dredging in the winter season of 2023/2024.	High
2	Walnut /Wildemere Beach (CRP Action WW3)	Coastal resiliency plan and permitting dune project for sand replenishment and outfall replacement /repair. Planning study completed 3/30/19. Permits not issued at this time. Requesting proposal from GEI/SLR to assist City to continue support for permitting. Project requires CT DEEP, USACE and USFWS review.	$525,000	CDBG-DR State and Federal funds	Director -DPW	3-5 years: November 2023 - March 2028	High
3	Gulf Street & Welchs Point Road Bluff Stabilization	The natural earth bluff was eroded by Storm Sandy. If it continues to erode, it will expose the underground	$275,000	CDBG-DR State and Federal funds	DPW Director	1-2 years: 2022 - March 2024	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		utilities and endanger the asphalt road. Planning and permitting project only. Planning study completed 3/30/19. Permits were issued fall 2019 and design plans are approximately 90% complete but still require construction level plans and bid specifications to be created. Project implementation identified as a new/separate mitigation action (see below) but is contingent upon funding.					
4	Gulf Street & Welchs Point Road Bluff Stabilization	Implement construction plans to protect the bluff and road infrastructure. Currently working to finalize bid specifications and construction plans and searching for suitable funding source.	$2,000,000	BRIC, LOTCIP or WRDA Funding	DPW Director	3-5 years: November 2023 - March 2028	High
5	Bayview Beach Area Flooding Study and Drainage Improvements (CRP Action BB2)	Bayview Beach Area Flooding Study and Drainage Improvements in the area of Field Court. The proposed planning, permitting, and	$120,000, Est. pump cost $130,000-$140,000	CDBG-DR; State and Federal funds, City Budget	Director -DPW	3-5 years: November 2023 - March 2028	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		construction project will mitigate flooding dangers in the area and provide safer access through the streets. Drainage improvements have been completed. Working to secure two (2) portable pumps for use in event dune is overtopped.					
6	Crescent Beach Resiliency (CRP Action BW2 and BW3)	Final construction design project bd specifications bidding and construction administration of resiliency project for Woodmont Crescent Beach. Crescent Beach Resiliency / USACE permits to be confirmed with conditions and reviewed with FECB / Develop scope of work for biding documentation. Planning Study Completed 3/30/19 Permits not issued at this time. USACE permits and conditions to be confirmed. Needs to be reviewed with the FECB.	$400,000	CDBG-DR State and Federal funds	DPW Director	1-2 years 2024-2025	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
7	Pelham Street (Bay Street-paper street) Public Access Resiliency (CRP Action MC6 and MC7)	Analysis of resiliency options to stabilize bluff and protect public access at the base of the Bay Street (paper street). Planning and permitting project only. Planning study completed 3/30/19., 40% design plans reviewed with DEEP, prior to DEEP permitting. Final DEEP COP Permit required.	$150,000	CDBG-DR State and Federal funds	Director -DPW	1-2 years: April 2022-2024	Medium
8	Wepawaug River Eisenhower Park Pond Maintenance Assessment	Dredge Wepawaug River Pond at Eisenhower Park. Repair dams and shore walls. The pond has been filled with silt and debris which threatens wildlife and habitats. Dredging, dam and spillway repair has not been done in several decades.	$1,545,000	CIRCA / HMA / City Budget	DPW Director	3-5 years: November 2022 - November 2025	Medium
9	Gulf Beach Breakwater (CRP Action GB-1)	Design plan, permitting and construction of a stone groin to protect Gulf Beach from sand erosion and sediment accumulation in Milford Harbor. Additional design required for the planning	$2,000,000	CDBG-DR State and Federal funds	DPW Director	5 years: September 2022- June 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		project revisions to respond to permitting requirements.					
10	Morningside Bluff, Seawall and Revetment Maintenance and repair	Construction of Morningside revetment to protect Morningside Drive and infrastructure. Maintenance and repair of the existing seawall along Morningside Drive repairs will be determined based on safety priority and funding. HUD CDBG-DR funding /Revetment Construction / $100,000 funding TBD.	Revetment Construction $1,700.000, Alternates estimated at $200,000 TBD/$100,000 funding TBD/$100,000 yearly maintenance	CDBG-DR / BRIC / HMA	Director -DPW	5 years: September 2023 - June 2028	High
11	Beaver Brook WWTP Flood Control Project (CRP Action SS1)	WWTP processes 25% of the City's Sewage and portions of the facility are located in the zone AE (10). Proposal to protect the infrastructure and functioning of the plant.	$2,000,000	FEMA HMA (BRIC, HMGP)	DPW Director	3-4 years: December 2022 - December 2024	High
12	Milford Point Road Elevation Project (CRP Action MP-1)	The road elevation project will mitigate street flooding occurring during lunar tides. The current project is for road elevation. The pedestrian sidewalk and boardwalk sections are being delayed pending additional	$2,000,000	CDBG-DR State and Federal funds	DPW Director	2022-2023	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		funding. Estimated at $700,000. Current funding is $501,537 towards the Milford Point Road Elevation. $500,000 additional funds needed.					
13	Debris Management Site Acquisition	Identify appropriate lands near the City's transfer site on Oronoque Road for purposes of disaster debris management. Previous identified site no longer available. Alternate sites to be assessed and recommended.	$1,300,000	HMA/ City Budget	DPW Director	2023-2028	High
14	Eisenhower Park Environmental / Existing Renovations	Environmental reclamation, natural resource & recreational improvement, floodplain and water quality improvement, park maintenance and park security. This project would combine multiple separate improvements to the park. A new pavilion would be installed that would include electricity, a small storage room, and a covering. The	$475,000	ARPA	APRA Grant Coordinator & Open Space Manager	2022-2026	Medium

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		surrounding grass area would be improved to make a more family-friendly picnic and play area. The park's walking trails would be assessed and improved where needed. The park's bathrooms would also be updated.					
15	Tumblebrook Flood Control Study	Commission study to control flooding along Tumblebrook which flows approximately 3,000 Linear feet from the Orange town line to Route 1 (Boston Post Road). Watershed encompasses over 500 acres of densely developed and populated area. Flooding occurs in heavy rains affecting many homes and flooding on Route 1. Develop scope of work for bidding documentation.	$100,000	CIRCA / HMA / DPW	DPW Director	1-2 years 2022-2023	Medium
16	City-Wide Flood Zone Warning System Upgrade	Flood gauge and flood warning system upgrades town wide. Develop scope of	$125,000	HMA	Emergency management Director	3-5 years: November 2023 - November 2028	Medium

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		work for bidding documentation					
17	IT Infrastructure	Where appropriate and when available the City needs to upgrade IT, mapping and communications infrastructure. This will give capabilities to mitigate and assess hazard risks and perform public outreach. This project will ensure security of municipal buildings, allowing for controlled door access. It will replace building data cabling and fiber where needed and provide wireless access where possible. Proximity card reads will be installed at all external doors at the Parsons Government Building, which will allow for remote or after-hours access to be granted to those authorized to be in the building. There will also be an update to the	$2,400,000	ARPA/HMA/City Budget	IT- Director	2022-2026	Medium

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		uninterruptible power supplies and generators to ensure continuity of operations. started 11/22.					
18	Coastal Resiliency for Areas Outside Existing Resiliency Projects	Milford has approximately 17 miles of coastline. Many low-lying shoreline neighborhoods are prone to flooding and shoreline erosion. Some have benefited from resiliency projects. Others are undergoing study. This project would review the remaining areas. Develop scope of work for biding documentation.	$500,000	BRIC /FMP / CIRCA /City Budget	DPW Director	3-5 years: November 2024 - November 2027	Medium
19	Wepawaug River Pond Dredging Maintenance - 3 lower ponds.	Periodic maintenance dredging will be needed at North Pond, City Hall Pond and Prospect St Pond locations to remove accumulated sediment to minimize the material flowing into the Harbor. Survey of the pond's depth should be scheduled to compare to baseline.	Engineering Assessment $10,000. Maintenance $200,000.	City Budget	DPW Director	3-5 years 2022-2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
20	Resilient CT Project for Multi-Family Housing Areas	Work with CIRCA to determine whether one of the two existing multi-family housing resilience opportunity areas identified by Resilient Connecticut should be scoped for project development.	Fees for City staff time - CIRCA covers costs	CIRCA/ City Budget	DPW Director /DPLU Director / Grants Coordinator	Five year project 2023-2028	Medium
21	Resilient CT Project for TOD Areas	Work with CIRCA to determine whether one of the two Transit Oriented Development resilience opportunity areas identified by Resilient Connecticut should be scoped for project development.	Fees for City staff time - CIRCA covers study costs	CIRCA/ City Budget	DPW Director /DPLU Director / Grants Coordinator	Five year project 2023-2028	Medium
22	Climate Resiliency Projects	Scoping and development of climate resilience planning projects for neighborhoods, City wide and regionally.	Medium to high	DEEP Climate Resilience Fund	DPW Director /DPLU Director / Grants Coordinator	3-5 years: November 2022 - November 2027	High
23	West Avenue Parallel Force Main Lining	Install cured-in-place liner inside approximately 5,800 linear feet of 30-inch diameter ductile iron force main. The existing force main was to be used should the parallel force main installed eight years ago need to have	$2,900,000	FEMA HMA (BRIC, HMGP, FMA); CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		repairs. Because of its condition the existing force main is out of service and cannot be used as intended.					
24	Sanitary Sewer and Manhole Lining Projects – Various Locations	Install cured-in-place liner in approximately 14,000 linear feet of the existing 8 to 21-inch diameter vitrified clay and reinforced concrete sanitary sewer and manholes. These sewers currently experience excessive inflow and infiltration and are in the Heatherstone area, Edgefield Avenue, Atwater Street, Ardmore Road, Sawmill Road, East Broadway area, and the siphon sewer at Pond Point Road.	A-B: $3,100,000; C: $400,000	FEMA HMA (BRIC, HMGP, FMA); CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High
25	Gulf Pond Pump Upgrades	This pumping station was constructed in 1989 with a major upgrade in 2012. The four existing pumps are original to the station and are vertical sewage pumps driven by 250 hp motors mounted on the upper floor	$2,600,000	FEMA HMA (BRIC, HMGP, FMA); CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		through drive shafts. Upgrade would replace the existing pumps and motors with new dry-pit submersible pumps.					
26	Karls Brook Flood Control Study	Karls Brook conduct and engineering study for flooding along Karls Brook, Karls brook flows approximately 6,000 linear feet from the Orange town line to Route 1 (Boston Post Road). Flooding occurs in heavy rains affecting many homes and businesses and impacting travel on Route 1.	$100,000	CIRCA/ City Budget	DPW Director	3-5 years: 2022 - 2027	Medium
27	Emergency Management Software	Enterprise emergency management software and hardware to coordinate departmental responses and collection of data for increased efficiency in emergency response situation. Documentation for Local, State and Federal reporting and response.	$250,000	BRIC/FMA Grant funding	IT- Director	3 years: 2023-2026	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
28	Flooding Recommendations property protections	Pursue elevation of residential properties that suffer flood damage; RLPs would be prioritized. Elevation is advised during reconstruction and requires FEMA standards. Working with property owners to review potential projects.	TBD	High / HMGP / BRIC and Private funding	Flood Plain Manager / Grants Coordinator	1- 5 years 2023-2028	High
29	Tree Management	Creation and implementation of an overall tree assessment and maintenance plan for City property. The town has a tree warden and crew but lacks sufficient funds for personnel, software, field hardware support, and equipment assets for a health assessment. An overall assessment and management plan would allow the crew to operate more efficiently and reduce the tree damage and electric grid downtime from storms. Tree assessment would provide data needed to	$100,000	HMA / City Budget	DPW Director	1-2 years 2023-2025	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		estimate costs of pruning and removals. Funding and software assessment.					
30	Wepawaug River Watershed and Resilience Plan	Creation of a watershed plan for the Wepawaug River focusing on water quality and flood resilience. Watershed plan is necessary for application for additional granting. Looking for funding source.	$150,00-$200,000	HMA / CIRCA	DPLU Director	3-5 years: November 2024 - November 2029	Medium
31	Stormwater Retrofits Plan	Creation of a stormwater retrofits plan to meet resilience and water quality goals. Looking for funding source. Plan for Mitigation and enhancement of flooding resiliency.	$100,000	BRIC / HMA	DPW Director - Engineering	1-2 years: 2022 - 2023	Medium
32	Stormwater Retrofits Implementation	Implementation of stormwater retrofits to meet resilience and water quality goals. Looking for funding source Implementation of mitigation and enhancement of flooding resiliency	$2,000,000	BRIC / HMA	DPW Director - Engineering	2-4 years: 2023 - 2025	Medium
33	EOC Equipment to utilize in storm response	Equipment and software involving EOC Activation. Planning stage.	$200,000	BRIC/FMA Grant funding	Emergency Management	2023 - 2028	Medium

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
					Director - IT Director		
34	Point Beach Drainage	Assessment of existing stormwater drainage and coastal resiliency improvements to minimize back flow LIS Tides. DPW Morehouse Groin Outfall pending DEEP SDF. Richard Street outfall DEEP COP-permitted. Elaine Street Access outfall maintenance above CJL. Atwater Access stormwater outfall TBD. PBIA starting DEEP permitted work with Yield industries 2022. City is looking to utilize design elements from the Bayview project and apply to the Point Beach outfalls.	$200,000	HMA / City Budget	DPW Director	2021-2023	High
35	Pump Station Generator Resiliency Project	Milford has 47 pump stations for its sanitary sewer system. Many of the City's sewer pump station standby generators and controls need to be updated/replaced due to age (older generators are failing during extended	$3,500,000	FEMA HMA (BRIC, HMGP, FMA); ARPA	DPW - Wastewater Superintendent	5 years: November 2022 - November 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		power outages). Additionally, some of the pump station buildings have deteriorated and need to be replaced. Additionally, a portable generator will be purchased to facilitate a quick connection in emergencies and prevent sewage by-passes during any future generator failures. Updates to these pump stations will be completed with sea-level rise protection and will help against flooding during storm events. Generators are critical to keeping the system operational when power is lost. 6 of the 47 pump stations have ARPA funding and are added as new individual projects with other pump station resiliency projects (see Actions 36-45 below). The City will continue to seek funding for all remaining stations.					

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
36	2021 Wastewater Pump Station Emergency Generators	Due to their age and recurring issues during emergencies the following wastewater pump station generators and transfer switches need to be replaced: Kurk Volk, Wanda, White Oaks, West Ave, Gulf Pond, Matthew, Anderson Mayflower and Milford Point. A portable 200 kw generator is also recommended for backup in case any permanent generator fails the portable generator can be connected to power the station. Note: the 200-kw portable generator will be capable of operating most of the cities pump stations except for the two largest and both treatment plants.	$1,504,000	FEMA HMA (BRIC, HMGP, FMA); ARPA	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High
37	2022 Pump Station Resilience Projects No. 1	Improvements and resiliency upgrades to five (5) existing sanitary sewer pump stations. Live Oaks, Watrous Ln, Old Gate Ln, New Haven	$4,360,000	ARPA Grant funding $1,815.000. remaining $2,545,000 TBD	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		Av, Sailors Ln. Implementation.					
38	Sanitary Sewer Pumping Station Upgrades No. 2	Upgrade 70's era pumping stations with new pumps and controls at Captain's Walk, Carriage Drive, Crowley Street, Kinlock Street, Kurt Volk, Morningside Drive, Naugatuck Avenue, and Wanda Road. Upgrades to protect against flooding during storm events.	$1,700,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High
39	Adams Avenue Pump Station Resilience Project	Improvements and resiliency upgrades to Adams Av Sanitary Sewer pump station. Implementation. Project has been awarded, delayed due to extremely long lead time for generator (55 weeks).	$58,135	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	2-3 years: 2022-2025	High
40	Rogers Avenue Sanitary Pumping Station Upgrade	Improvements and resiliency upgrades to replace the pumps and controls, channel grinders, stand-by generator and buried fuel oil tank. Upgrades will also be made to protect against flooding during storm events.	$3,630,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
41	Milford Point Pumping Station Upgrade	Improvements and resiliency upgrades to replace the pumps and controls, channel grinders, stand-by generator and buried fuel oil tank. Upgrades to protect against flooding during storm events.	$2,600,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High
42	Mathew Street Pumping Station Upgrade	Improvements and resiliency upgrades to replace the pumps and controls, channel grinders, stand-by generator and buried fuel oil tank. Upgrades to protect against flooding during storm events.	$1,200,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High
43	Anderson Avenue Pumping Station Upgrade	Improvements and resiliency upgrades to replace the pumps and controls, channel grinders, stand-by generator and buried fuel oil tank. Upgrades to protect against flooding during storm events.	$1,500,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High
44	Viscount Drive Pumping Station Upgrade	Improvements and resiliency upgrades to replace. Proposed upgrades would protect the pump controls,	$2,000,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High

Action #	Action Title	Action Description	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
		transformers, and stand-by generator against flooding during storm events.					
45	Upgrades to Protect Pumping Stations and Treatment Facilities from Sea Level Rise	Improvements and resiliency upgrades to 10 additional pumping stations not included in other projects, and the Beaver Brook WWTF to protect against flooding during storm events and sea level rise.	$1,700,000	FEMA HMA (BRIC, HMGP, FMA); HUD CDBG-DR	Wastewater Superintendent - DPW	3-5 years: November 2022 - November 2027	High