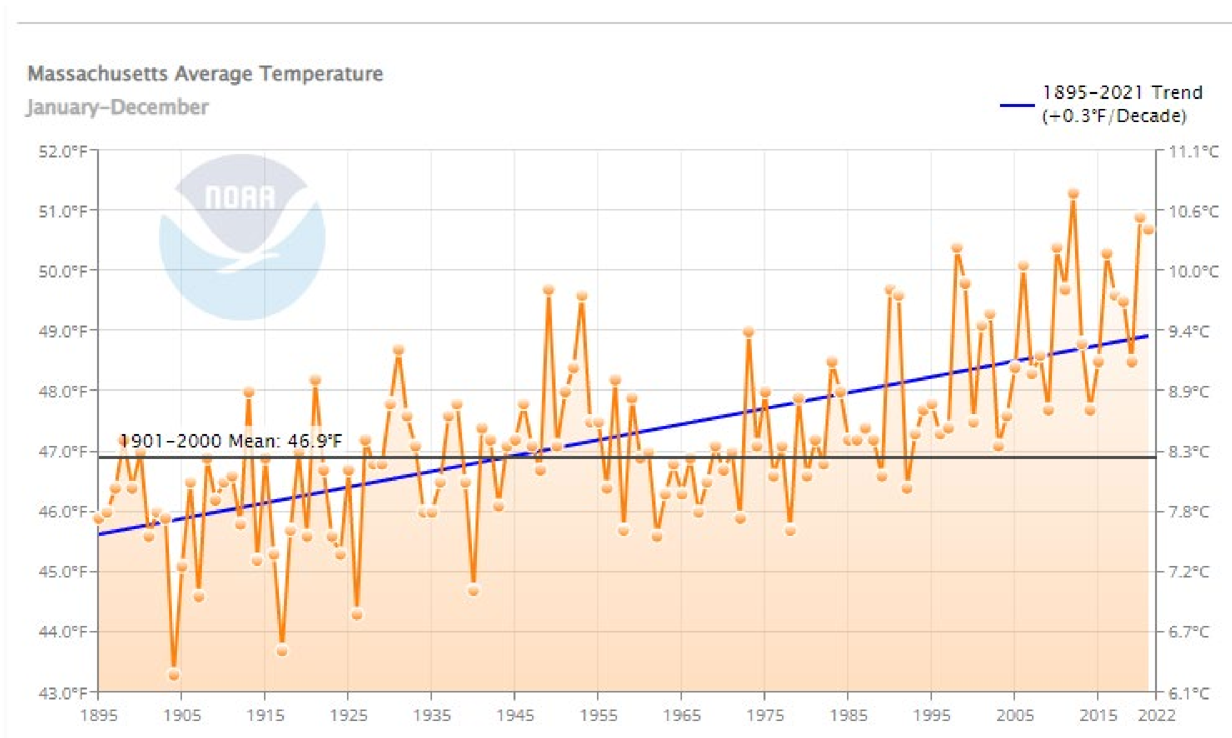
Appendix B. Climate Change Synopsis for the APC Region

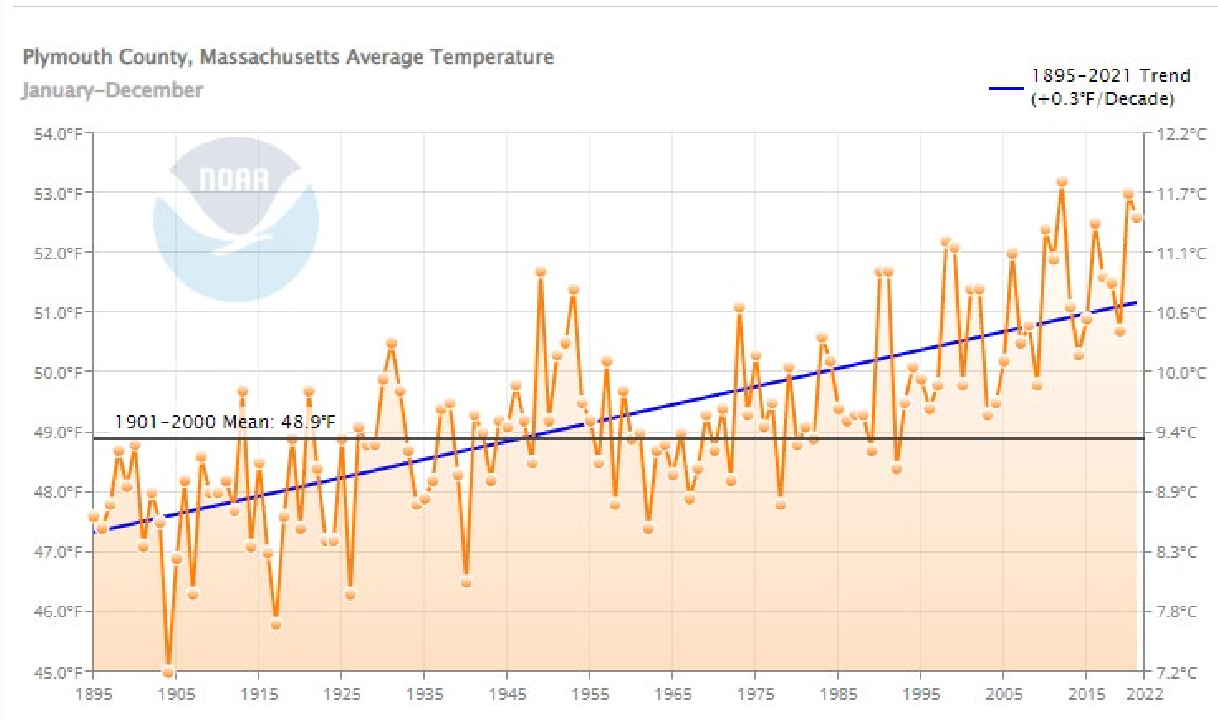
Climate Change Trends and Projections for the APC Region

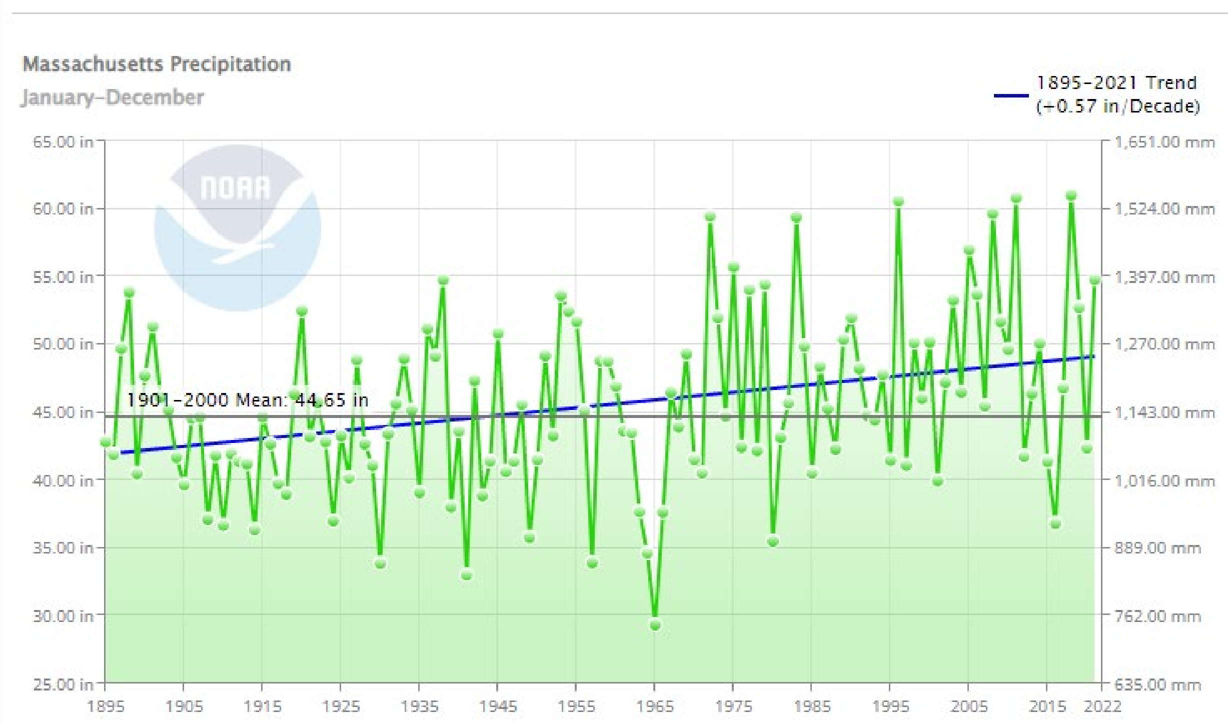
Both measured trends and modeled projections provide insight on likely future climate in the APC watershed. In conjunction these tools provide a range of expected future conditions. Two factors limit the accuracy of future climate projections; (1) future greenhouse gas emission rates are unknown, and (2) while climate models are increasingly sophisticated, they are not capable of incorporating all of the detail and nuance of the process they attempt to replicate. For these reasons modeled climate projections are typically presented as ranges of likely future conditions rather than specific values. Given this uncertainty, monitoring changing environmental conditions will be an important component of managing the watershed for a dynamic climate.

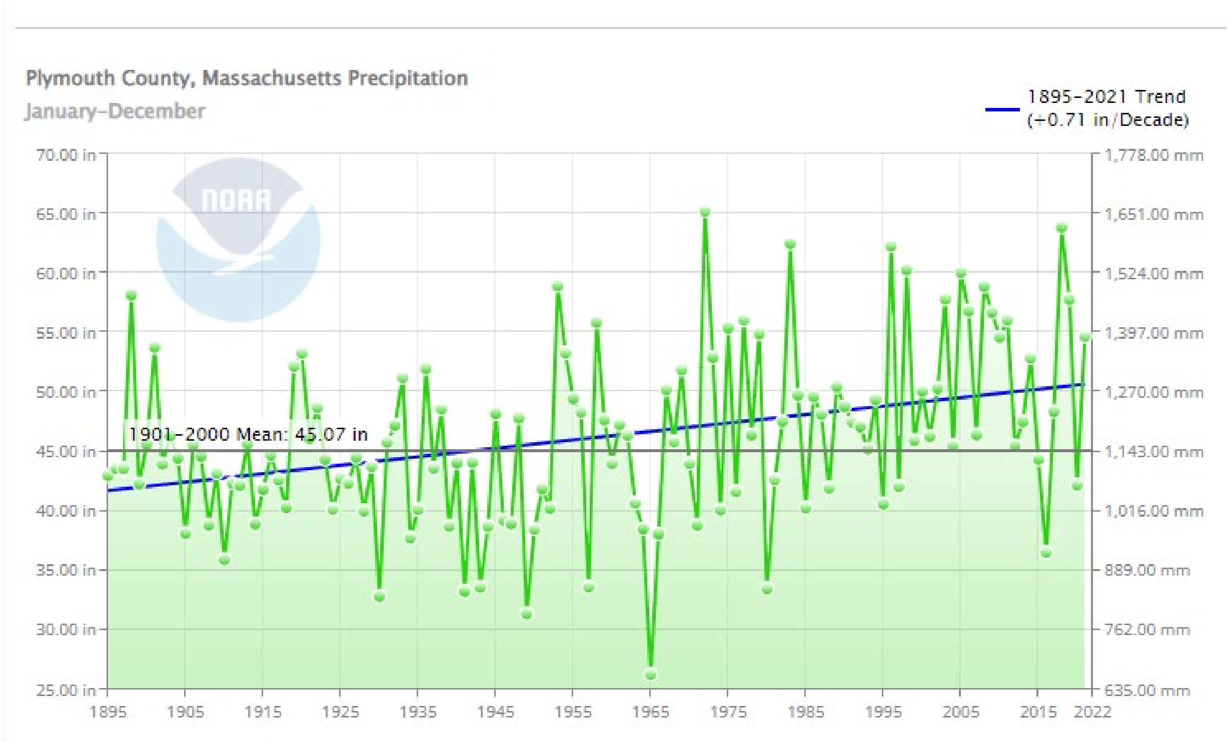
Measured Climate Trends

Both average annual temperature and precipitation have increased for the state of Massachusetts and Plymouth County during the period 1895 2021 as shown in the charts below:




Plymouth County, Massachusetts Average Temperature
January–December
1895–2021 Trend
(+0.3°F/Decade)
1901–2000 Mean: 48.9°F
54.0°F
53.0°F
52.0°F
51.0°F
50.0°F
49.0°F
48.0°F
47.0°F
46.0°F
45.0°F
12.2°C
11.7°C
11.1°C
10.6°C
10.0°C
9.4°C
8.9°C
8.3°C
7.8°C
7.2°C
1895 1905 1915 1925 1935 1945 1955 1965 1975 1985 1995 2005 2015 2022


Massachusetts Precipitation
January–December
1895–2021 Trend
(+0.57 in/Decade)
1901–2000 Mean: 44.65 in
65.00 in
60.00 in
55.00 in
50.00 in
45.00 in
40.00 in
35.00 in
30.00 in
25.00 in
1,651.00 mm
1,524.00 mm
1,397.00 mm
1,270.00 mm
1,143.00 mm
1,016.00 mm
889.00 mm
762.00 mm
635.00 mm
1895 1905 1915 1925 1935 1945 1955 1965 1975 1985 1995 2005 2015 2022



Source: NOAA National Centers for Environmental information, Climate at a Glance: Statewide Time Series, published February 2022, retrieved on February 23, 2022 from https://www.ncdc.noaa.gov/cag/

Measured Trends in Flood Threat

A 2016 analysis of trends in U.S. flood risk by Slater and Villarini found starkly different regional patterns of changing flood risk across the nation, with some regions showing decreasing risk and others showing increasing risk. Eastern Massachusetts is one of the areas in the U.S. where both stream gages and basin water storage assessment showed increasing flood risk during the period 2002 – 2015.

Source: Slater, Louise J., and Gabriele Villarini. "Recent trends in US flood risk." Geophysical Research Letters 43.24 (2016): 12-428.

Climate Change Projections for the Taunton River Watershed

The following tables contain climate change projections for the Taunton River Watershed developed by the Northeast Climate Science Center. Additional background, projections, and supporting documentation on the modeling process are available on the ResilientMA website on the page titled Massachusetts Climate Change Projections - Statewide and for Major Drainage Basins.

Temperature projections are generally considered to be more reliable than precipitation projections. Under both emissions scenarios considered the Taunton River Watershed is projected to warm significantly through the end of the century. Increasing average temperatures will drive an increase in occurrence of extreme heat. Change in precipitation is a bit less certain with the possibility of either increase or decrease depending on the season under consideration and the time horizon. Winter and spring are generally projected to have increasing precipitation. Summer and fall projections include the possibility of either increase or decrease. The frequency and intensity of heavy precipitation events are projected to increase, continuing observed trends in the northeast.

Taunton Basin		Observed Baseline 1971-2000 (°F)	Projected Change in 2030s (°F)	Mid-Century Projected Change in 2050s (°F)	Projected Change in 2070s (°F)	End of Century Projected Change in 2090s (°F)
Average Temperature	Annual	49.9	+2.0 to +3.8	+2.7 to +5.9	+3.1 to +8.6	+3.4 to +10.5
	Winter	30.0	+2.2 to +4.4	+2.9 to +6.7	+3.5 to +8.8	+3.9 to +10.1
	Spring	47.3	+1.7 to +3.4	+2.4 to +5.4	+2.6 to +7.5	+3.1 to +9.2
	Summer	69.6	+1.7 to +3.9	+2.2 to +6.3	+2.8 to +9.6	+3.4 to +11.6
	Fall	52.1	+2.1 to +4.5	+3.4 to +6.3	+3.2 to +9.0	+3.7 to +11.2
Maximum Temperature	Annual	60.3	+1.9 to +3.7	+2.5 to +5.9	+2.8 to +8.6	+3.1 to +10.4
	Winter	39.5	+1.8 to +4.2	+2.5 to +6.2	+3.0 to +8.1	+3.4 to +9.4
	Spring	58.0	+1.5 to +3.4	+2.0 to +5.2	+2.5 to +7.6	+3.0 to +9.0
	Summer	80.5	+1.6 to +3.8	+2.1 to +6.2	+2.7 to +9.7	+3.1 to +11.6
	Fall	62.7	+2.1 to +4.4	+3.3 to +6.4	+3.1 to +9.0	+3.4 to +11.3
Minimum Temperature	Annual	39.4	+2.1 to +3.9	+2.9 to +6.1	+3.4 to +8.6	+3.8 to +10.6
	Winter	20.5	+2.5 to +4.7	+3.2 to +7.3	+4.1 to +9.4	+4.4 to +10.8
	Spring	36.7	+1.8 to +3.5	+2.7 to +5.7	+2.7 to +7.4	+3.2 to +9.1
	Summer	58.6	+1.8 to +3.9	+2.4 to +6.5	+2.9 to +9.4	+3.6 to +11.5
	Fall	41.6	+2.1 to +4.7	+3.5 to +6.3	+3.3 to +9.0	+4.0 to +11.1

Taunton Basin		Observed Baseline 1971-2000 (Days)	Projected Change in 2030s (Days)	Mid-Century Projected Change in 2050s (Days)	Projected Change in 2070s (Days)	End of Century Projected Change in 2090s (Days)
Days with Maximum Temperature Over 90°F	Annual	7	+5 to +15	+7 to +29	+9 to +50	+12 to +65
	Winter	0	+0 to +0	+0 to +0	+0 to +0	+0 to +0
	Spring	1	+<1[93] to +1	+<1[93] to +1	+<1[93] to +2	+<1[93] to +3
	Summer	7	+5 to +13	+6 to +25	+8 to +42	+11 to +53
	Fall	<1[93]	+1 to +2	+1 to +4	+1 to +7	+1 to +10
Days with Maximum Temperature Over 95°F	Annual	1	+1 to +5	+2 to +11	+3 to +25	+4 to +38
	Winter	0	+0 to +0	+0 to +0	+0 to +0	+0 to +0
	Spring	<1[93]	+0 to +<1[93]	+<1[93] to +<1[93]	+<1[93] to +<1[93]	+<1[93] to +1
	Summer	1	+1 to +4	+2 to +10	+2 to +22	+3 to +34
	Fall	<1[93]	+<1[93] to +1	+<1[93] to +1	+<1[93] to +3	+<1[93] to +4
Days with Maximum Temperature Over 100°F	Annual	<1[93]	+<1[93] to +1	+<1[93] to +3	+<1[93] to +6	+<1[93] to +13
	Winter	0	+0 to +0	+0 to +0	+0 to +0	+0 to +0
	Spring	0	+0 to +<1[93]	+0 to +<1[93]	+0 to +<1[93]	+0 to +<1[93]
	Summer	<1[93]	+<1[93] to +1	+<1[93] to +3	+<1[93] to +6	+<1[93] to +12
	Fall	0	+0 to +<1[93]	+<1[93] to +<1[93]	+<1[93] to +<1[93]	+<1[93] to +1

Taunton Basin		Observed Baseline 1971-2000 (Inches)	Projected Change in 2030s (Inches)	Mid-Century Projected Change in 2050s (Inches)	Projected Change in 2070s (Inches)	End of Century Projected Change in 2090s (Inches)
Total Precipitation	Annual	47.5	-0.1 to +4.1	+0.3 to +5.4	+0.9 to +6.6	+0.4 to +7.3
	Winter	12.1	-0.3 to +1.5	+0.0 to +2.0	+0.2 to +2.7	+0.1 to +3.8
	Spring	11.9	-0.1 to +1.8	+0.0 to +2.0	+0.1 to +2.4	+0.2 to +2.6
	Summer	11.0	-0.6 to +1.1	-0.7 to +1.7	-1.7 to +2.4	-1.9 to +2.1
	Fall	12.4	-0.8 to +1.1	-0.9 to +1.5	-1.5 to +1.7	-1.7 to +1.4

Taunton Basin		Observed Baseline 1971-2000 (Days)	Projected Change in 2030s (Days)	Mid-Century Projected Change in 2050s (Days)	Projected Change in 2070s (Days)	End of Century Projected Change in 2090s (Days)
Days with Precipitation Over 1”	Annual	8	+<1[95] to +2	+1 to +3	+1 to +3	+1 to +4
	Winter	2	+<1[95] to +1	+<1[95] to +1	+<1[95] to +1	+<1[95] to +2
	Spring	2	+<1[95] to +1	+<1[95] to +1	+<1[95] to +1	+<1[95] to +2
	Summer	2	-0 to +<1[95]	-0 to +1	-0 to +1	-0 to +1
	Fall	2	-0 to +1	-0 to +1	-0 to +1	-0 to +1
Days with Precipitation Over 2”	Annual	1	-0 to +<1[95]	+<1[95] to +1	+<1[95] to +1	+<1[95] to +1
	Winter	<1[95]	-0 to +<1[95]	+<1[95] to +<1[95]	+<1[95] to +<1[95]	-0 to +<1[95]
	Spring	<1[95]	-0 to +<1[95]	+<1[95] to +<1[95]	-0 to +<1[95]	-0 to +<1[95]
	Summer	<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]
	Fall	<1[95]	-0 to +<1[95]	+<1[95] to +<1[95]	+<1[95] to +<1[95]	-0 to +<1[95]
Days with Precipitation Over 4”	Annual	<1[95]	-0 to +<1[95]	+<1[95] to +<1[95]	-0 to +<1[95]	-0 to +<1[95]
	Winter	0	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]
	Spring	0	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]
	Summer	<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]
	Fall	<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]	-0 to +<1[95]

Taunton Basin		Observed Baseline 1971-2000 (Days)	Projected Change in 2030s (Days)	Mid-Century Projected Change in 2050s (Days)	Projected Change in 2070s (Days)	End of Century Projected Change in 2090s (Days)
Consecutive Dry Days	Annual	17	-0 to +1	-0 to +3	-1 to +3	-0 to +4
	Winter	11	-1 to +2	-1 to +2	-1 to +2	-1 to +2
	Spring	12	-1 to +1	-1 to +1	-1 to +1	-1 to +1
	Summer	14	-1 to +1	-1 to +2	-1 to +2	-1 to +3
	Fall	13	-0 to +2	-0 to +3	-0 to +3	-0 to +3

Source: Massachusetts Climate Change Projections - Statewide and for Major Drainage Basins, Northeast Climate Science Center, March 2018, https://resilientma.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-for-major-drainage-basins

Changing Precipitation and Flood Threat

Flooding is the result of multiple factors that are specific to the impacted area. The U.S. National Climate Assessment characterizes projecting changes in future flood threat as a "complex, multivariate problem". The increasing annual precipitation and increase in heavy precipitation occurring and projected in the APC region have the potential to exacerbate flooding. According to the U.S. National Climate Assessment:

- Heavy precipitation events in the Northeast have increased in both intensity and frequency since 1901.
- The frequency and intensity of heavy precipitation events are projected to continue to increase over the 21st century.

Source: Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner, 2017: Precipitation change in the United States. In: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC.

The following section, quoted from the supporting narrative for the climate projections for Massachusetts developed by the Northeast Climate Science Center, highlights several aspects of changing flood threat in the State:

> "Rainfall is expected to increase in spring and winter months in particular in Massachusetts, with increasing consecutive dry days in summer and fall. More total rainfall can have an impact on the frequency of minor but disruptive flooding events, especially in areas where storm water infrastructure has not been adequately sized to accommodate higher levels. Increased total rainfall will also affect agriculture, forestry and natural ecosystems.
>
> More intense downpours often lead to inland flooding as soils become saturated and stop absorbing more water, river flows rise, and the capacity of urban storm water systems is exceeded. Flooding may occur as a result of heavy rainfall, snowmelt, or coastal flooding associated with high wind and wave action, but precipitation is the strongest driver of flooding in Massachusetts. Winter flooding is also common in the state, particularly when the ground is frozen. The Commonwealth experienced 22 flood-related disaster declarations from 1954 to 2017 with many of these falling in winter or early spring, or during recent hurricanes.
>
> The climate projections suggest that the frequency of high-intensity rainfall events will trend upward. Overall, it is anticipated that the severity of flood-inducing weather events and storms will increase, with events that produce sufficient precipitation to present a risk of flooding likely increasing. A single intense downpour can cause flooding and widespread damage to property and critical infrastructure. The coast will experience the greatest increase in high-intensity rainfall days, but some level of increase will occur in every area of Massachusetts."

Source: Massachusetts Climate Change Projections - Statewide and for Major Drainage Basins, Northeast Climate Science Center, March 2018, https://resilientma.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-for-major-drainage-basins

A key point in this synopsis is the role of increasing precipitation intensity in exacerbating flash flood threat in areas of impervious surface.

One approach to assessing changing flood threat is tracking trends in overall basin wetness. The 2016 analysis by Slater and Villarini utilized data from NASA's GRACE mission to track change across the continental U.S. showed increasing basin wetness across all of Massachusetts. Quoting from the paper:

> "In sum, in a warming world where changes in the spatial and temporal distributions of precipitation and large-scale climate indices are affecting the magnitude and frequency of high flows [Groisman et al., 2001; Karl et al., 2009; Mallakpour and Villarini, 2015, 2016], our findings reveal that there are actually strong regional patterns of changing flood risk which can be assessed and communicated from a practical standpoint in terms of the local threat to people and assets. These regional patterns are preconditioned by overall basin wetness, especially in low-lying areas with notable water storage. Thus, any projections of changes in flood risk above the action, minor, moderate, and major flood categories based on the observed amplification of precipitation extremes should most certainly take into account the short-term, concomitant changes in basin wetness resulting from broad-scale shifts in climate and water management."

Source: Slater, Louise J., and Gabriele Villarini. "Recent trends in US flood risk." Geophysical Research Letters 43.24 (2016): 12-428.

It is important to note that the period of record of this study is relatively short making it difficult to assess the extent to which the trends in basin wetness are attributable to climate change. As previously mentioned, monitoring changing environmental conditions in the APC watershed will be an important component of assessing changing flood threat.

Extreme Storms

Several factors associated with extreme storms in the northeast region are changing in ways that increase risk for the APC region. The Extreme Storms chapter of the Fourth National Climate Assessment characterizes changing extreme storm threat as follows:

- Tropical cyclone precipitation rates, intensity and frequency of the most intense storms are projected to increase in the North Atlantic.
- The locations where tropical cyclones reach peak intensity is moving northward in the North Atlantic as the climate warms.
- Extratropical cyclones, including Nor'easters, are also projected to become more intense although model to model differences are high.

Source: Kossin, J.P., T. Hall, T. Knutson, K.E. Kunkel, R.J. Trapp, D.E. Waliser, and M.F. Wehner, 2017: Extreme storms. In: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 257-276, doi: 10.7930/J07S7KXX.

Drought

Projections of change in drought frequency and intensity for the northeast region vary among different modeling approaches and are therefore considered to be of low confidence. That being said, warming average and extreme temperatures are projected to make drought that does occur more impactful through a variety of means including increasing vapor pressure deficit (VPD). A 2013 analysis of the impact of “hot drought” on forest health makes the following points:

- Atmospheric demand for moisture, as quantified by VPD, increases in conjunction with warming atmospheric temperatures.
- The combined impact of increasing average temperatures, increasing extreme heat, and increasing VPD is stressing forests as climate change progresses.

Source: Breshears, David D., et al. "The critical amplifying role of increasing atmospheric moisture demand on tree mortality and associated regional die-off." *Frontiers in plant science* 4 (2013): 266.

The following section, quoted from the supporting narrative for the climate projections for Massachusetts developed by the Northeast Climate Science Center, highlights several aspects of changing drought threat in the State:

> “A small projected decrease in average summer precipitation in Massachusetts could combine with higher temperatures to increase the frequency of episodic droughts, like the one experienced across the Commonwealth in the summer of 2016.
>
> Droughts will create challenges for local water supply by reducing surface water storage and the recharge of groundwater supplies, including private wells. More frequent droughts could also exacerbate the impacts of flood events by damaging vegetation that could otherwise help mitigate flooding impacts. Droughts may also weaken tree root systems, making them more susceptible to toppling during high wind events.”

Source: Massachusetts Climate Change Projections - Statewide and for Major Drainage Basins, Northeast Climate Science Center, March 2018, https://resilientma.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-for-major-drainage-basins

MVP and Climate Resilience Actions in the APC-Nemasket

Climate change and the creative re-use of community resources (particularly those related to natural resources) are at the core of the town’s ability to respond to the pressures caused by climate change. The Municipal Vulnerability Preparedness (MVP) program assist towns in identifying their top four climate-related hazards, and then propose certain solutions or action items to help address those vulnerabilities. Summarized below are the action items proposed by these towns as they intersect with the vulnerabilities present in or near the Assawompset Ponds Complex and Nemasket River watershed. These actions may overlap with actions proposed in the management plan, indicating that action should be a high priority for implementing bodies to pursue.

Freetown is primarily concerned about flooding, extreme temperatures, drought, and high winds. These first three categories primarily respond to a concern about the management and supply of water (both in excess and deficit depending on the time of year) and the secondary impacts that this can have on septic systems, flood risk, fire potential (ex, drought leading to more fire), and public health (ticks and mosquitoes).

Action Statement	Priority	Category
General MVP Advice		
Work on a regional approach with nearby towns who share water sources and supply with Freetown.	L	I
Explore grant/loans to expand sewer coverage to flooding-vulnerable areas, like in Assonet Bay Shores, Heaven Heights	L	I
Replace bridges on the causeway leading to Assonet Bay Shores	M	I
Replace bridges on Beach Bluff Road leading to Hemlock Point (Long Pond)	M	I
Raise the road at the dip before Lazy-A driving range and again at the Rochester town line.	M	I
Address flooding caused by the culvert on Fall Brook at Chippeway Road	M	I
Monitor and provide education on the impact of invasive species on water levels in Long Pond as well as other environmental impacts.	M	E
Monitor and provide education on the impact of invasive species on water levels in Assawompset Pond as well as other environmental impacts.	M	E
Regional Addendum		
Review Existing Management Plan for Assawompset Pond and conduct a study of flooding impacts on water quality while including engagement with neighboring towns		
Consider milfoil management and partner with Lakeville for improved regulation, education, and monitoring		
Explore grant and loan funding for septic system maintenance		

Lakeville's top issues of concern include **flooding, extreme storms/winds, extreme temperatures, and drought/fire.** Given Lakeville's proximity and intimate relationship with the ponds and water resources throughout town, the impact of heavy rainfall, 'king tides', and high-water levels in the ponds can easily lead to devastating flooding. On the drought side, because the town is heavily reliant on private wells, drought conditions can lead to water loss and an inability for the towns to adequately fight fires.

Action Statement	Priority	Category
General MVP Advice		
Conduct a town-wide assessment of all culverts, prioritizing right-sizing and re-placement in locations where flooding is already a serious issue (Taunton Street (Poquoy Brook), Cross Street, Pickens Street, Route 18, Snake River, Route 105, Pierce Avenue at Bittersweet Road, and County Road by the Eagles)	H	I
Consider strategic property acquisition for flood storage in order to mitigate flood-related property damages and emergency risks, particularly to shoreline properties		
Consider Low-Impact Development approaches to stormwater management for flood resilience and water quality.		
Implement proactive removal of hazardous trees in coordination with the Taunton Municipal Light Plan, Eversource, and Middleborough Gas and Electric District.		
Explore Elevating Bedford St	H/M	I
Increase infiltration and investigate opportunities for acquiring property for flood storage at inter sections (Captain's Way, Heritage, Freetown St, County Rd., Old Powder House)		

Increase collaboration w/ Taunton + New Bedford to protect surrounding land for increased water quality	L	E
Create/add to BOH + ConCom materials on Do's and Don'ts of herbicides, pesticides, and water mgmt. on your property, particularly related to septic systems		
Institute sediment removal by working with public works to create drainage out- lets where feasible; assess areas where treatments are needed/nature-based stormwater management plan		
Develop and implement the Nemasket River Dam/Sediment Plan; veg. removal, dam removal, floodplain reclamation	H	
Get the town the resources to be able to participate in a coordinated effort with MassDOT, TMLP, and Middleboro G&E tree assessment and removal/a forestry mgmt. plan		
Update the Ponds Management Plan to include climate change, resilience, access		
Regional Addendum		
Develop and implement a Nemasket River Restoration Plan to address issues of silting, invasive species, water quality, dams and herring passage.		
Apply for Priority Project status with the Division of Ecological Restoration to re-move/replace dams and culverts along the river		
Conduct a feasibility study to assess invasive species removal in the Pond Complex and Nemasket River.		
Request a boat-washing station for Long Pond from the Department of Conservation and Recreation, to reduce spread of invasives throughout Lakeville's waterways.		
Daylight Squam Brook, a former emergency outfall of Long Pond that is no longer in use		

Middleborough's top categories of concern include **flooding, severe storms /winds, drought/temperature extremes, and vector borne diseases.** Many of these hazards intersected with the town's geography as a location with a high water table and densely forested undergrowth which are particularly susceptible to extreme weather events. High water levels impact every dimension of Middleborough's environment, infrastructure, and social capacity.

Action Statement	Priority	Category
General MVP Advice		
Conduct a town wide location/assessment study of our culverts/drainage	M	
Do a feasibility study and alternatives assessment for removal or restoration of the Bascule Dam at Wareham St.	M/L	
Look at nature-based infiltration/storage options in the Summer Street area	M	
Look at alternatives for location/elevation of the Discharge point of the Wastewater Treatment Plant		
Look at the creation of a regionally consistent wetlands protection bylaw for the watershed communities (APC pilot)		
Explore community-owned and co-housing. Review bylaws to allow areas of higher density housing that is more accessible to low-income households. 40B- Look at zoning; weigh impacts to our Green Infrastructure; look at efficient affordable housing design/types (incentives). **Look at advocating for changes to state requirements for the improvements we're seeking. Encourage energy efficient homes		
Amend zoning and subdivision bylaws to minimize the development of housing on flood-prone lands. Fund land protection/study T.D.R. and reuse open space subdivision bylaw.		
Install a greywater capture system at the library as a pilot project		
Plymouth St. Bridge: replace bridge and water line		
Vernon St Bridges: bridge replacement needed over Poquoy Brook and Taunton River		

Downtown Drainage: Conduct a study of drainage in the town center. The study should include both constructed fixes and nature-based solutions such as rain gardens and grey water capture.		

Rochester's main hazards of concern included the **Flood/Drought cycle, pests (vectors, invasive species), Storms/High Winds, and Forestry Health.** Rochester is notable for the fact that the first three stresses have a particularly outside impact on forestry health which is so essential to the town's character. Rochester attributes a high intensity storm/drought cycle for weakening trees roots, pests for killing and hollowing out trees, and then extreme storms for knocking those weakened trees over.

Action Statement	Priority	Category
General MVP Advice		
Continue advocating for sustainable water management in Rochester with regional neighbors and the state		
Increase public education about adverse effects of residential fertilizer and pesticide applications in relation to water quality, citing specific examples from the Town's past.		
Incorporate information about common septic and well issues on Town website's "Information for New Residents" page (to be created).		
Consider Low-Impact Development as part of stormwater management planning; incorporate rain gardens in vulnerable flood areas where feasible.		
Develop a proactive long range water supply plan for the Town in collaboration with regional partners.		
Review bylaws for opportunities to protect cranberry farmers from solar development pressures.		
Conduct a priority replacement list of culverts and pipes throughout town		
Replace culvert and dam for the Millers Bridge and Dam		
Replace culvert and dam for the Snipatuit Causeway		
Replace culvert for the Doggett (DOR) culvert		
Replace culvert and dam for the Hathaway Pond Dam		
Replace culverts on Mattapoisett river and New Bedford River		
Create a cooperative forestry management plan with New Bedford. Control Gypsy moths		

New Bedford's main hazards of concern include **Intense Storms, Heat Waves and changes in Air Quality, Flooding, and Sea Level Rise**. While New Bedford does not have much space in the APC-Nemasket watershed, given the important role that the APC plays as a water supply source for the city, the city has several action items related to preservation and protection of the watershed.

Action Statement	Priority	Category
General MVP Advice		
Ensure we are taking all steps to protect aquifer protection zone through forest management around reservoir and addressing invasive species		
Create a tree inventory and plant heritage tree program recommended trees for our region		

The City of **Taunton** is currently in the process of updating its Municipal Vulnerability Preparedness plan as well as its Hazard Mitigation Plan. The plan is projected to be released in the summer of 2022.