Locally Variable Hazard Differentiation

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WestCOG's 18-member municipalities face a range of climate hazards that vary meaningfully in type, severity, and planning implications depending on where a community sits within the regional landscape. The Regional Climate Assessment of the WestCOG Climate and Stormwater Hazard Assessment translates the shared regional risk foundation established in the Regional Climate Assessment into locally specific, community-differentiated hazard profiles and planning guidance designed to directly inform each municipality's Plan of Conservation and Development (POCD).

This Local Climate Assessment organizes WestCOG's municipalities into five community categories: (1) Coastal-High, (2) Coastal-Moderate, (3) Inland-High, (4) Inland-Moderate, and (5) Inland-Low. For each community, the chapter evaluates risk across seven hazard categories: extreme storm events, rainfall-driven flooding, riverine flooding, coastal flooding, extreme heat, drought, and wildfire. Risk profiles are grounded in four spatial factors: coastal proximity, watershed context, topography and elevation, and land cover and impervious surface coverage. "High" denotes high risk based on these factors, while "Low" denotes limited or lower risk. The key findings are as follows:

- **Coastal-High communities**: Stamford and Norwalk, face the region's most comprehensive and severe climate risk profile. Compounding coastal flood, extreme heat, and rainfall-driven flooding are rated High. This rating is driven by dense development, aging infrastructure, low coastal elevation, and the region's greatest concentration of socially vulnerable populations. Climate adaptation should be a cross-cutting priority across planning functions for these communities.
- **Coastal-Moderate communities**: Darien, Greenwich, and Westport share coastal flood exposure with high-risk storm surge and sea level rise risk. Lower development density and ecologically sensitive tidal wetland systems provide some natural buffering, but high-value coastal property exposure and compound flood dynamics require proactive coastal resilience planning.
- **Inland-High communities**: Danbury faces the region's most significant inland flood and heat risk. Rainfall-driven flooding, riverine flooding along the Still River corridor, and extreme heat are all considered high risk, compounded by aging infrastructure, high impervious surface coverage, and significant social vulnerability.
- **Inland-Moderate communities**: Bethel, Brookfield, New Canaan, New Fairfield, New Milford, Newtown, Ridgefield, Weston, and Wilton – face moderate to moderate-high risk across most hazard categories, with riverine flooding and wildfire as primary planning priorities. Within-category differences between more developed southern towns and more rural northern communities are significant and identified throughout the community's risk profile (see Community Risk Profiles).
- **Inland-Low communities**: Bridgewater, Redding, and Sherman, face the region's highest wildfire risk, compounded by drought, limited suppression capacity, and private well vulnerability. These communities also steward the region's most ecologically valuable landscapes, and their resilience planning carries important downstream impacts beyond their municipal boundaries.

Across all community categories, several findings stand out, such as extreme precipitation intensifying in ways that will stress stormwater infrastructure region-wide, the compounding relationship between drought, heat, and wildfire, and the flood risk and exposure in coastal and urban communities. The planning recommendations that conclude this document translate these findings into clear, community-differentiated guidance that will inform the model POCD chapter recommendations developed in the next phase of this work.

Introduction and Purpose

Climate hazards do not affect all communities equally. While the Regional Climate Assessment established the shared regional foundation of climate risk across WestCOG, the Locally Variable Hazard Differentiation draws the distinctions that matter most for local planning by identifying where, how, and to what degree specific hazards apply to individual municipalities. This document also translates those distinctions into actionable, locally grounded guidance for each community's POCD.

The WestCOG region is composed of 18 member municipalities: the principal cities of Stamford, Norwalk, and Danbury, and fifteen towns, including Bethel, Bridgewater, Brookfield, Darien, Greenwich, New Canaan, New Fairfield, New Milford, Newtown, Redding, Ridgefield, Sherman, Weston, Westport, and Wilton. The region spans a diverse range of landscapes, from dense urban waterfronts along the Long Island Sound to forested inland towns at the edges of the Housatonic watershed. Southern coastal areas, including Stamford and Norwalk, are the most densely developed and contain ecologically sensitive tidal wetlands susceptible to storm surge, coastal flooding, and drought. The northern inland city of Danbury represents the region's third major urban center. Beyond these cities and their surrounding moderate-density suburbs, the region transitions to predominantly deciduous forest, inland wetlands, and low-density rural landscapes.

These physical and demographic differences are consequential for climate risk. Coastal location, development density, watershed context, land cover, and topography all shape which hazards a community faces and how severely. To reflect these differences efficiently and provide guidance directly useful to individual municipalities, WestCOG's 18 communities are categorized into five category groupings:

1. ***Coastal-High***: *Stamford and Norwalk*
2. ***Coastal-Moderate:*** *Darien, Greenwich, and Westport*
3. ***Inland-High:*** *Danbury*
4. ***Inland-Moderate:*** *Bethel, Brookfield, New Canaan, New Fairfield, New Milford, Newtown, Ridgefield, Weston, and Wilton*
5. ***Inland-Low:*** *Bridgewater, Redding, Sherman*

Table 1. Community Categorization within WestCOG

Community	Community Category				
	Coastal-High	Coastal-Moderate	Inland-High	Inland-Moderate	Inland-Low
Norwalk	●				
Stamford	●				
Darien		●			
Greenwich		●			
Westport		●			
Danbury			●		
Bethel				●	
Brookfield				●	

Community	Community Category				
	Coastal-High	Coastal-Moderate	Inland-High	Inland-Moderate	Inland-Low
New Canaan				●	
New Fairfield				●	
New Milford				●	
Newtown				●	
Ridgefield				●	
Weston				●	
Wilton				●	
Bridgewater					●
Redding					●
Sherman					●

These groupings serve as the organizing framework for the Climate and Stormwater Hazard Assessment (Assessment). Communities within each category share broadly similar risk profiles driven by the same underlying physical principles and characteristics. Where meaningful differences exist within a category, specific municipalities are identified by name. There are no Coastal-Low density communities in the study area. Table 1 shows the categorization of each municipality.

This Locally Variable Hazard Differentiation is organized into five parts. The first establishes a localized context and introduces the analytical approach used to evaluate hazard risk by community type. The second explains how individual hazards interact and compound one another, which is an important dynamic for coastal and urban communities. The third presents the hazard applicability matrix (Table 2), which provides a municipality-by-municipality summary of risk ratings across all hazard categories. The fourth presents a full risk profile for each of the five community categories. The fifth provides planning recommendations that translate risk findings into planning guidance that will be utilized in the next phase of this work, revolving around POCD-ready guidance and chapters.

Key Terms and Definitions

The following terms appear throughout this document. Definitions are provided here for reference and consistency across community profiles.

Annual Chance Floodplain: The area subject to flooding at a given probability in any given year. The 1% annual chance floodplain (100-year floodplain) has a 1% chance of being flooded in any given year. The 0.2% annual chance floodplain (500-year floodplain) has a 0.2% chance of flooding in any given year. These designations are used in FEMA Flood Insurance Rate Maps (FIRMs) to delineate areas of regulatory flood risk.

Sea Level Rise: The long-term increase in mean sea level driven by thermal expansion of ocean water and the melting of land-based ice. Along the Long Island Sound, sea level rise raises baseline water levels, increases the frequency and extent of tidal inundation, amplifies storm surge impacts, and accelerates saltwater intrusion into freshwater aquifers and coastal wetland systems. Sea level rise projections are foundational inputs for coastal flood risk assessment and coastal resilience planning for WestCOG's coastal communities.

Storm Surge: The abnormal rise in sea level generated by wind and atmospheric pressure from tropical or mid-latitude cyclones. Storm surge pushes ocean water inland ahead of and during major storms and represents an acute coastal flood hazard for coastal communities. Surge height and inland extent depend on storm track, wind speed, atmospheric pressure, coastline geometry, and baseline sea level.

Compound Flooding: The simultaneous or sequential occurrence of multiple flood mechanisms, such as storm surge, tidal backflow, and intense rainfall, that produce inundation greater than a single mechanism alone. Compound flooding is an important risk to coastal communities where riverine, pluvial, and coastal flood pathways interact.

Impervious Surface: Any surface like pavement, rooftops, compacted gravel, and other urban infrastructure, that prevents water from infiltrating into the ground. High concentrations of impervious surfaces accelerate stormwater runoff, increase flood frequency and severity, and intensity urban heat island effects. Impervious surface coverage is a primary driver of flood and heat risk differences across WestCOG community types.

Orographic Lift: The process by which moist air is forced upward over higher terrain, causing it to cool and condense and resulting in increased precipitation at higher elevations. Orographic lift contributes to slightly higher severe thunderstorm frequency in WestCOG's inland communities at higher elevations compared to coastal communities.

Social Vulnerability: The degree to which a population is susceptible to the impacts of hazard events based on socioeconomic and demographic characteristics, including income level, age, disability status, language access, and household transportation access. Social vulnerability shapes how severely communities are affected by the same physical hazard. Populations with higher social vulnerability often face greater barriers to preparation, evacuation, and recovery. Social vulnerability data in this chapter is from FEMA's National Risk Index, which provides census-tract-level vulnerability scores based on demographic and socioeconomic indicators.

Urban Heat Island Effect: The phenomenon by which developed urban areas experience significantly higher temperatures than surrounding rural and suburban landscapes due to the concentration of heat-absorbing impervious surfaces, reduced tree canopy, and waste heat from buildings and vehicles. The urban heat island effect is most pronounced overnight, when urban surfaces continue releasing stored heat while rural areas cool. Urban heat island intensity is directly correlated with impervious surface coverage and inversely correlated with tree canopy coverage.

Analytical Approach

Understanding why climate hazards affect WestCOG municipalities differently requires looking beyond regional averages to the local physical and contextual conditions that shape risk on the ground. Four spatial factors: (1) coastal proximity, (2) watershed context, (3) topography and elevation, and (4) land cover and impervious surfaces, were used to evaluate hazard risk across all 18 municipalities and form the analytical foundation for the Assessment.

Coastal proximity is the single most differentiating factor in the region. Communities situated along the Long Island Sound face storm surge, saltwater intrusion, sea level rise, and compound flooding risks that do not exist for inland communities. Watershed context determines how water moves through the landscape and how hazards accumulate across municipal boundaries – including the important distinction between communities draining to the Southwest Coastal, Housatonic, and Hudson HUC-8 watersheds, and the upstream-downstream relationships that connect municipalities across the region. Topography and elevation shape how natural forces move across landscapes, concentrating flood hazards in low-lying valleys, amplifying wildfire behavior on steep terrain, and determining how much natural buffer exists between a community and incoming storm surge, as illustrated in the digital elevation model for the region in Figure 1. Land cover and impervious surface coverage drive differences in runoff volume, flood frequency, wildfire exposure, and urban heat across community types. The contrast between the high impervious surface concentration in coastal urban communities, illustrated in NLCD land cover data in Figure 2, and the extensively forested inland communities, is an important risk differentiator in the region. Social vulnerability, shown in Figure 3 using FEMA's National Risk Index, provides essential context about where physical hazard exposure intersects with potentially limited capacity to prepare, respond, and recover from major events.

These four factors: (1) coastal proximity, (2) watershed context, (3) topography and elevation, and (4) land cover and impervious surfaces, were applied consistently across seven hazard categories: extreme storm events, rainfall-driven flooding, riverine flooding, coastal flooding, extreme heat, drought, and wildfire. Not every hazard applies equally across every community as coastal flooding is applicable only to coastal communities. Wildfire risk is most acute in the region's inland forested communities. Extreme heat is most severe in dense urban heat islands. The hazard applicability matrix in Table 2 summarizes risk ratings across all 18 municipalities and all seven hazard categories, providing a concise reference for the detailed profiles below.

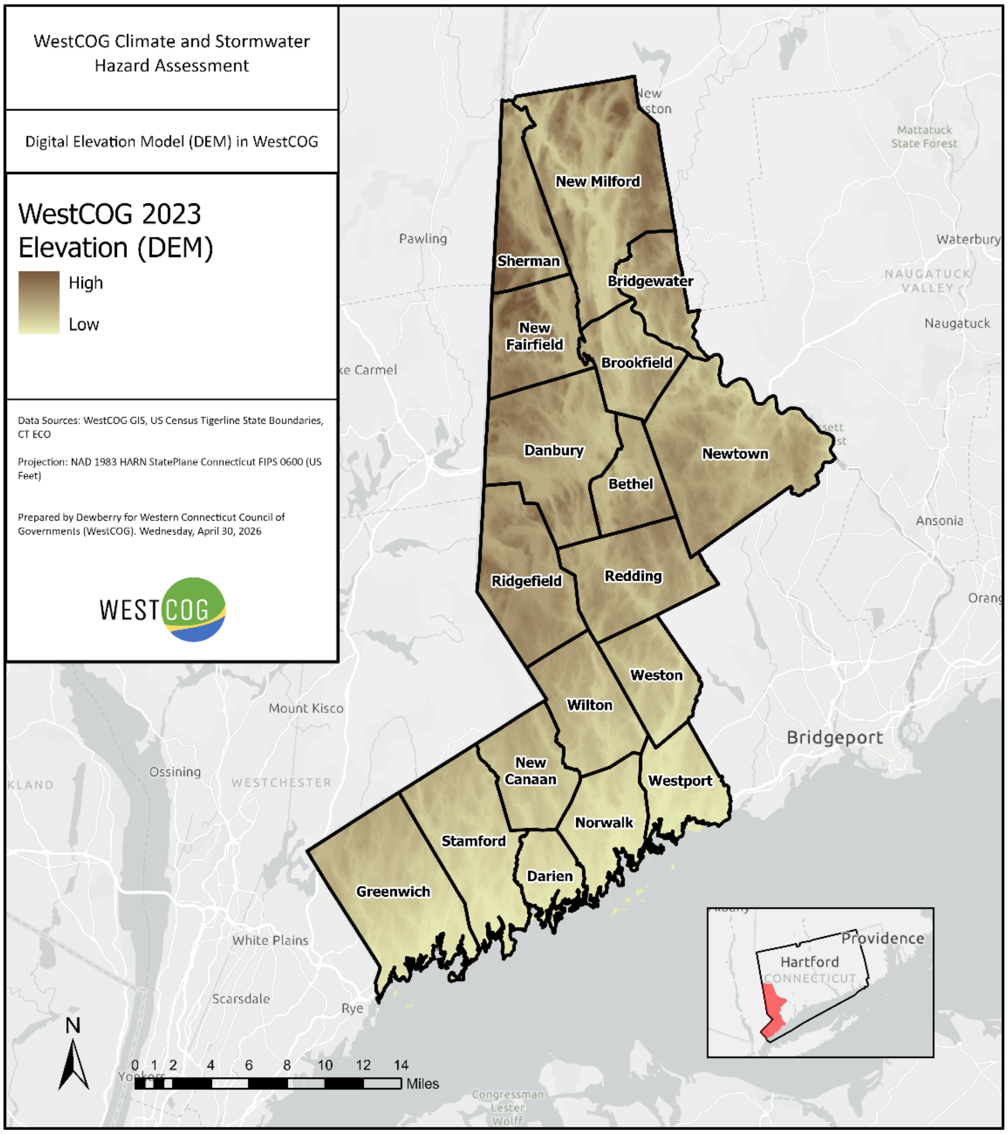

Figure 1. DEM for WestCOG

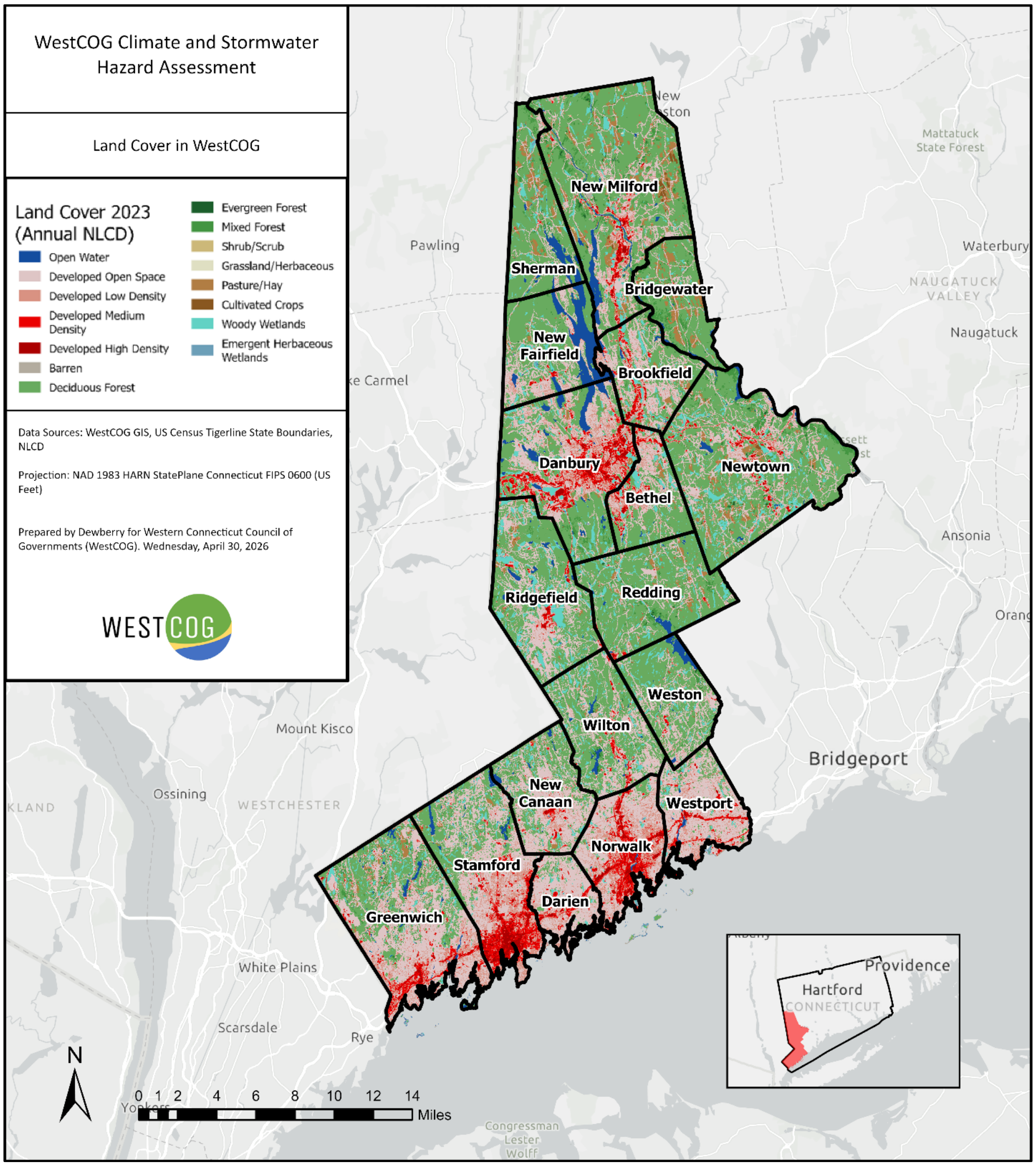

Figure 2. Land cover in WestCOG from the NLCD

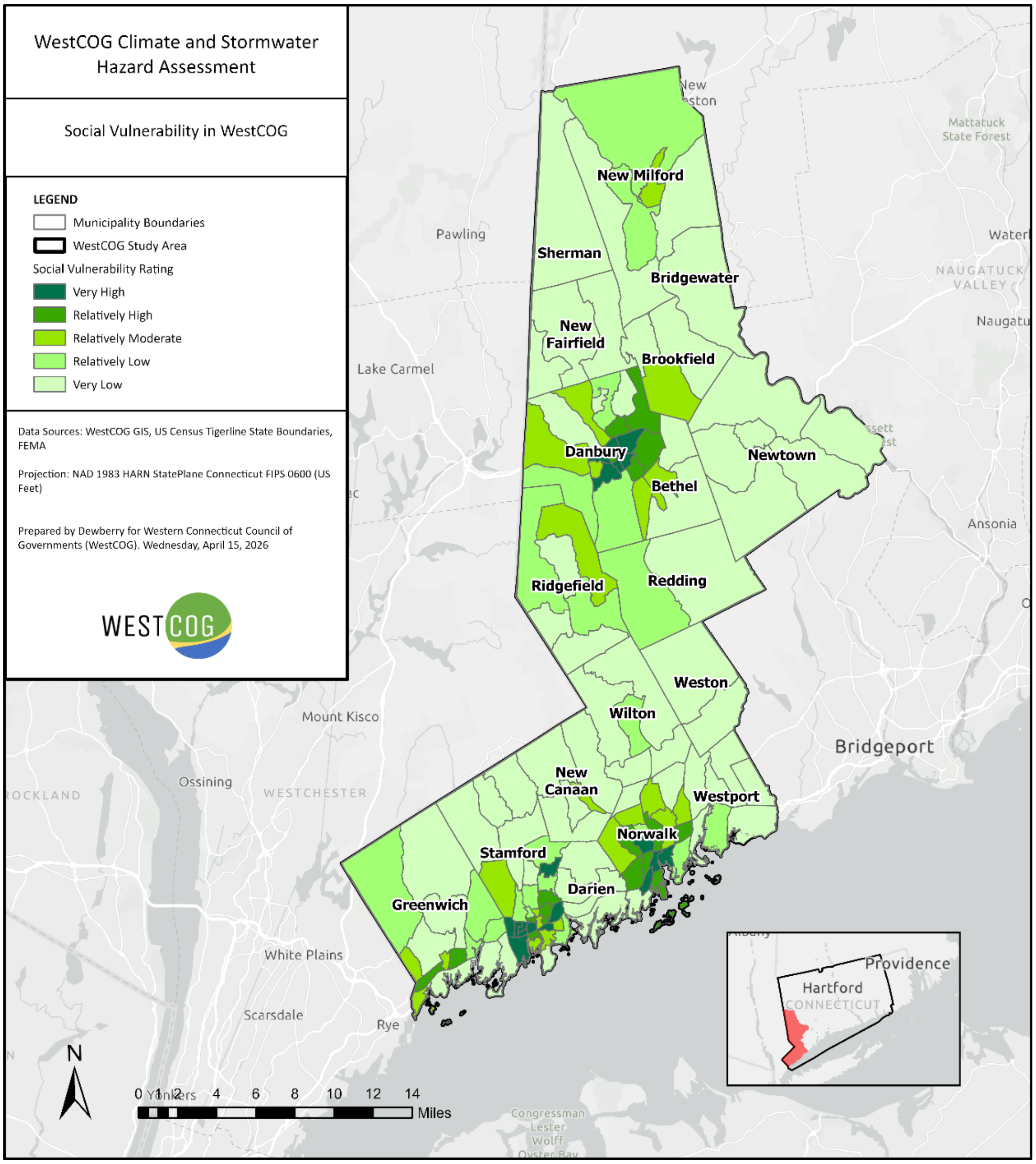

Figure 3. Social Vulnerability in WestCOG from FEMA's NRI

Each community category profile is organized consistently: an introduction characterizing the community type and overall risk profile, a watershed context section establishing the hydrological setting, and a hazard risk profile addressing all seven hazard categories. After, follows a planning recommendations section tailored to that community's POCD context. Where a hazard is not applicable, it is noted explicitly. Together, these profiles translate the regional risk foundation into locally specific, planning-ready guidance that WestCOG municipalities need to develop POCDs that accurately reflect their individual risk and position themselves to drive meaningful climate resilience action for each community.

Hazard Interactions and Compounding Risk

Individual hazards rarely occur in isolation, and understanding how hazards interact is essential context for the community risk profiles. Hazard interactions can be a single event, such as a tropical cyclone that simultaneously produces heavy rainfall, high winds, and coastal storm surge, where each amplifies the potential damage of the others. Other risks may have extended time frames. For example, a prolonged drought that dries out soils and vegetation raises wildfire risk while simultaneously concentrating water pollutants and stressing the urban tree canopy. See the image below, originally included in the Regional Climate Assessment, for a visualization of how hazards can influence and interact with each other.

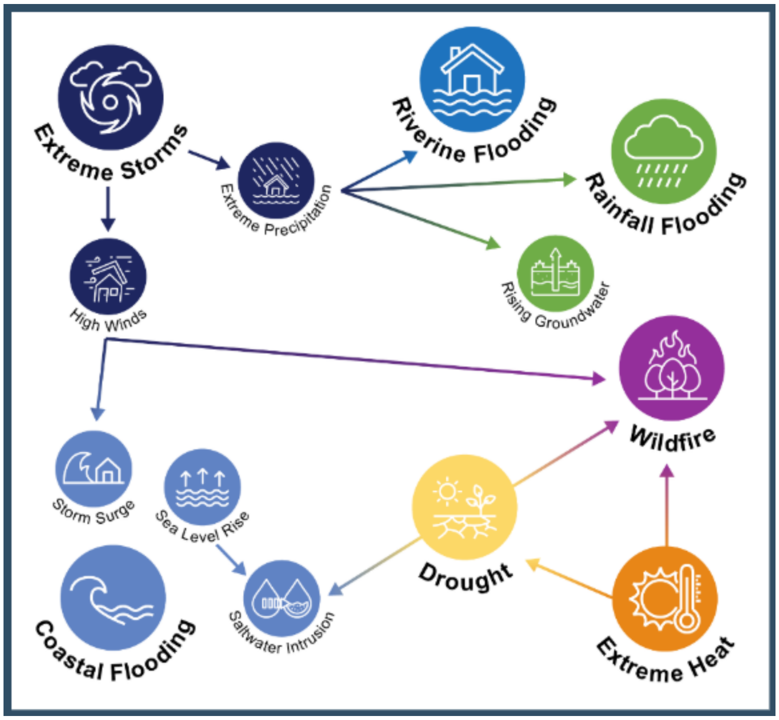

Figure 4. Interactions between regional hazards.

As the climate continues to warm, these hazard interactions and compounding risks will intensify. Higher baseline temperatures, more humid atmospheric conditions, rising sea levels, and increasingly severe precipitation events will raise the likelihood that multiple hazards co-occur and reinforce one another. Where compounding hazard relationships are particularly significant for a community, they are explicitly identified in the risk profiles below.

Hazard Applicability Matrix

A hazard applicability matrix that distinguishes between region-wide hazards common to all municipalities and locally variable hazards applicable to specific municipal groupings is presented below in Table 2. Each community was evaluated based on coastal proximity, topography, land cover, and impervious surface coverage, and social vulnerability, to determine local variability and relative risk. WestCOG communities are primarily located in two Hydrologic Unit Code (HUC)-8 or “sub-basin” watersheds: the Southwest Coastal and the Housatonic. The Hudson HUC-8 watershed slightly overlaps the municipalities of Ridgefield, Danbury, New Fairfield, and Sherman across their western borders.

Four risk ratings were created to categorize the hazard exposure and impact on each community. They are as follows:

Minimal Risk: The community is at little to no risk from this hazard.

Lower Risk: The community is at lower risk relative to the region from this hazard.

Regional Risk: Risk from this hazard is present in this community, with no local characteristics differentiating hazard risk level.

Heightened Risk: The community is at increased risk from this hazard based on local variables.

Table 2. Hazard Applicability Matrix Based on Risk

Municipality	Hazards						
	Extreme Storm Events	Rainfall (Pluvial) Flood	Riverine (Fluvial) Flood	Coastal Flood	Extreme Heat	Drought	Wildfire
Coastal-High							
Norwalk	Regional Risk	Heightened	Heightened Risk	Heightened Risk	Heightened Risk	Regional Risk	Lower Risk
Stamford	Regional Risk	Heightened	Heightened Risk	Heightened Risk	Heightened Risk	Regional Risk	Lower Risk
Coastal-Moderate							
Darien	Regional Risk	Heightened	Heightened Risk	Heightened Risk	Regional Risk	Regional Risk	Lower Risk
Greenwich	Regional Risk	Heightened	Heightened Risk	Heightened Risk	Heightened Risk	Regional Risk	Lower Risk
Westport	Regional Risk	Heightened	Heightened Risk	Heightened Risk	Regional Risk	Regional Risk	Lower Risk
Inland-High							
Danbury	Regional Risk	Heightened Risk	Heightened Risk	Minimal Risk	Heightened Risk	Regional Risk	Regional Risk
Inland-Moderate							
Bethel	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
Brookfield	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
New Canaan	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
New Fairfield	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk

Municipality	Hazards						
	Extreme Storm Events	Rainfall (Pluvial) Flood	Riverine (Fluvial) Flood	Coastal Flood	Extreme Heat	Drought	Wildfire
New Milford	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
Newtown	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
Ridgefield	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
Weston	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
Wilton	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Regional Risk	Regional Risk
Inland-Low							
Bridgewater	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Heightened Risk	Heightened Risk
Redding	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Heightened Risk	Heightened Risk
Sherman	Regional Risk	Regional Risk	Regional Risk	Minimal Risk	Regional Risk	Heightened Risk	Heightened Risk

Community Risk Profiles

The following Community Risk Profiles provide an assessment of combined hazard risk for the included communities within each grouping introduced in Table 1: Coastal-High, Coastal-Moderate, Inland-High, Inland-Moderate, and Inland-Low.

Coastal-High

Stamford and Norwalk are the two Coastal-High municipalities within WestCOG and have the region's highest overall climate risk profile. Both are densely developed cities situated along the Long Island Sound, combining high concentrations of impervious surfaces, low-lying coastal elevation, aging infrastructure, and the region's greatest concentrations of socially vulnerable populations. This convergence of physical exposure and social vulnerability means that hazard impacts in these communities are not only more frequent and severe, but potentially longer-lasting with more complex recovery operations.

Stamford and Norwalk are also the region's most complex planning environments. Both cities contain a wide range of land uses – downtown metropolitan areas, residential neighborhoods of varying age and condition, industrial waterfront areas, coastal open space, and tidal wetland systems, which can all interact with climate hazards differently. Planning for climate resilience in these communities requires addressing not just individual hazards in isolation, but the cascading and compounding ways in which multiple hazards interact across a dense, interconnected urban landscape.

These communities should treat climate risk as a central organizing principle of their POCDs, with hazard mitigation findings directly informing zoning, infrastructure investment, housing, coastal resilience planning, and emergency management. The risk profile documented should serve as a foundation for the range of planning initiatives that typically follow a POCD update, from zoning regulation updates to coastal resilience plans.

Watershed Context

Both Stamford and Norwalk fall within the Southwest Coastal HUC-8 watershed. Their drainage systems are characterized by short, steep stream corridors that flow directly to the Long Island Sound with limited opportunity for natural attenuation or infiltration. Urbanization has dramatically increased the volume and velocity of stormwater entering these systems, replacing permeable soils, forests, and wetlands with pavement and rooftops. The resulting floods are more intense flash flood responses to rainfall events of all sizes. Stormwater systems in both cities were designed for historical rainfall patterns and land cover conditions that no longer reflect current or projected future realities. Investments in green infrastructure, wetland restoration, and impervious surface reduction represent meaningful opportunities to restore natural attenuation capacity to these watersheds.

Hazard Risk Profile

Extreme Storm Events

All WestCOG municipalities share baseline exposure to tropical cyclones, nor'easters, and severe thunderstorms. For Stamford and Norwalk, extreme storm events carry a compounding risk profile that fundamentally distinguishes them from inland communities. In addition to heavy rainfall and high winds, Coastal-High communities experience storm surge – the wind-driven push of ocean water inland that can overwhelm coastal barriers, inundate low-lying neighborhoods, and cut off evacuation routes. The simultaneous occurrence of surge, intense rainfall, and high winds creates cascading infrastructure failures that inland communities do not face.

Older infrastructure in both cities may not meet current wind or flood standards. Critical facilities including hospitals, emergency services, wastewater treatment plants, and transformation infrastructure are vulnerable to cascading failure during major events.

Rainfall-Driven Flooding

The high proportion of impervious surfaces across both cities means rainfall is rapidly converted to surface runoff. When rainfall intensity exceeds drainage infrastructure capacity (which is becoming increasingly common as storm events intensity) water accumulates quickly on streets, in underpasses, and in low-lying neighborhoods. Both cities have aging stormwater systems designed for historical rainfall patterns that will increasingly diverge from future conditions. Chronic street flooding and localized inundation already occur regularly during moderate rain events, and this will likely worsen in the future without deliberate infrastructure investment.

Coastal proximity adds a critical compounding dimension. During major storm events, tidal backflow and storm surge can block or overwhelm stormwater drainage outfalls entirely, causing ponding when rainfall totals alone would not produce significant flooding. Standard stormwater assessments that evaluate rainfall-driven flooding in isolation can underestimate actual flood risk in these communities. Low-lying neighborhoods near drainage outfalls and census tracts with aging infrastructure should be treated as high priority for resilience interventions.

Riverine Flooding

Both Stamford and Norwalk contain significant riverine floodplain areas as delineated in the FEMA Flood Insurance Rate Maps. Population centers adjacent to the 1% and 0.2% annual chance floodplains are at elevated and ongoing risk. High impervious surface coverage accelerates runoff delivery into rivers and streams, raising water levels more rapidly and increasing flash flood frequency and severity.

Compounding flooding is a defining characteristic of riverine risk in Coastal-High communities. When extreme high tides or storm surge coincide with intense inland rainfall, tidal waters block drainage outfalls and force water upstream, producing wider, deeper and longer-duration flooding than either hazard would generate alone. Standard FEMA FIRMs do not capture this dynamic, meaning actual flood exposure in both cities is likely greater than current maps suggest. Socially vulnerable populations are disproportionately likely to reside in floodplain areas and face compounded exposure.

Coastal Flooding

Coastal flooding is the defining hazard distinction of Coastal-High communities and encompasses three interrelated risks: storm surge, sea level rise, and saltwater intrusion.

Storm Surge

Stamford and Norwalk are directly exposed to storm surge from tropical and mid-latitude cyclones. Both cities contain extensive low-lying coastal neighborhoods, industrial waterfront areas, transportation infrastructure, and critical facilities where even moderate surge events cause significant inundation. Existing coastal protective structures may have been designed using historical storm conditions and sea levels, and their protective capacity will diminish as baseline water levels rise.

Sea Level Rise

The Long Island Sound is experiencing measurable and accelerating sea level rise. Rising baseline water level systematically increases the frequency and extent of tidal inundation, converting rare flood events into routine occurrences. Low-lying coastal areas currently experiencing occasional king tide flooding will face increasingly frequent and prolonged inundation, affecting coastal infrastructure functionality, neighborhood habitability, and the ecological integrity of coastal wetland systems. Over longer timeframes, sea level rise could fundamentally alter the risk calculus for coastal development and investment in both cities.

Saltwater Intrusion

As sea levels rise and surge events penetrate further inland, saltwater infiltrates freshwater aquifers, coastal soils, and wetland systems. This poses risks to drinking water supplies, coastal vegetation, and the ecological function of tidal wetlands that provide natural buffering against storm surge and flooding. Degradation of these wetland systems reduces natural coastal protection and increases the engineered infrastructure burden on both cities. The combination of high impervious coverage, low coastal elevation, aging protective infrastructure, and high social vulnerability makes Coastal-High communities some of the most exposed communities in WestCOG.

Extreme Heat

Stamford and Norwalk face the region's highest extreme heat risk, driven by the urban heat island effect. High concentrations of impervious surfaces, dense building stock, and limited tree canopy in lower-income neighborhoods elevate ambient temperatures several degrees above surrounding areas. As temperatures rise, heat waves will become more frequent, longer, and more intense. Populations most at risk such as elderly residents, young children, people with chronic health conditions, outdoor workers, and low-income households without access to air conditioning, are disproportionately concentrated in the socially vulnerable census tracks of both cities. Power grid stress during extended heat events introduces additional system risk, with high cooling demand capable of causing outages precisely when relief infrastructure is most needed. Extreme heat also compounds other hazards, worsening air quality through increased ground-level ozone formation and contributing to drought conditions that stress urban tree canopy and elevate wildfire risk.

Drought

Stamford and Norwalk face meaningful drought risk that intersects with and amplifies several other hazards in their risk profile. Extended precipitation deficits, accelerated by higher temperatures increases evapotranspiration demand, stress water supply systems, degrade urban tree canopies, compromise wetland ecological function, and elevate wildfire ignition risks in parks and greenway corridors.

Water supply infrastructure in both cities depends on reservoir and groundwater systems sensitive to prolonged precipitation deficits. As summer dry periods lengthen, the gap between water demand and available supply will narrow. Urban tree canopy is particularly vulnerable to drought stress, and protecting investments in urban forestry requires proactive drought resilience planning, including species diversification toward drought-tolerant varieties. Drought conditions also degrade coastal and inland wetland function, concentrate pollutants in water bodies, and affect water quality in the Long Island Sound and its tributary systems.

Wildfire

Wildfire is not a primary hazard for Stamford and Norwalk, but it is not absent. Parks, greenway corridors, and urban-wildland interface zones, particularly in the northern areas of both cities, can support fire ignition and spread during drought conditions. Prolonged drought and extreme heat dry out fine fuels and stress urban tree canopies, while dry high-wind events can rapidly spread ignition across forested areas. Wildfire risk in these communities is best addressed through urban forest and open space management rather than traditional fire suppression planning alone.

Coastal-Moderate

Darien, Greenwich, and Westport share many of the coastal hazard characteristics of Stamford and Norwalk, but they differ in meaningful ways. All three are situated along the Long Island Sound with direct coastal exposure, but are characterized by lower development density, greater tree canopy and permeable surface coverage, higher-quality housing stock, and significantly lower concentrations of socially vulnerable populations. These differences moderate the severity of some hazard impacts while introducing distinct vulnerabilities, particularly around high-value coastal property exposure, ecologically sensitive shoreline systems, and the gap between safety and risk in coastal communities. These communities should use their POCDs to establish a proactive, forward-looking framework for coastal resilience that accounts for accelerating sea level rise, increasing storm intensity, and the long-term implications of continued coastal investment in a changing climate.

Watershed Context

Darien and Greenwich fall within the Southwest Coastal HUC-8 watershed, sharing the same short, steep coastal drainage characteristic of Stamford and Norwalk, though with meaningfully lower impervious surface coverage that provides somewhat greater natural attenuation capacity. Westport falls within the Southwest Coastal watershed as well, with drainage concentrated around the Saugatuck River system, which flows directly to the Long Island Sound and is a primary driven of both riverine and compound flood risk in the community. The lower development density across all three communities means their watersheds retain more natural infiltration capacity than Coastal-High community counterparts, but ongoing development pressure continues to incrementally reduce that capacity. Watershed-level land use decisions, including impervious surface management and riparian buffer protection, remain important tools for maintaining the natural flood buffers that mitigate flood risk in these communities.

Hazard Risk Profile

Extreme Storm Events

Darien, Greenwich, and Westport share regional exposure to tropical cyclones, nor'easters, and severe thunderstorms with all WestCOG municipalities. Like Coastal-High communities, their coastal position means extreme storm events carry compounding risks beyond rainfall and wind, as storm surge from major cyclones can inundate low-lying coastal neighborhoods, damage coastal infrastructure, and compromise evacuation routes. However, lower development density and generally higher coastal elevations in portions of all three communities provide a somewhat greater natural buffer than is present in Stamford and Norwalk. High-value residential and commercial coastal properties represent significant economic exposure in all three communities. Older coastal structures, including historic homes and waterfront estates, may not meet current wind or flood resistant construction standards despite their high market value. Critical facilities and transportation infrastructure serving these communities are vulnerable to the same cascading failure dynamics present across all coastal communities during major storm events.

Rainfall-Driven Flooding

While lower impervious surface coverage across Darien, Greenwich, and Westport reduces the intensity of rainfall-driven flooding relative to Coastal-High communities, pluvial flood risk remains meaningful, particularly near the coast and in low-lying neighborhoods. As rainfall events become more intense and episodic, the capacity of existing drainage infrastructure will increasingly be stressed. Coastal proximity compounds pluvial risk during major storm events. Tidal backflow and storm surge can block stormwater outfalls, causing ponding in areas that would otherwise drain effectively. Developed residential areas near the coast in all three towns, especially those with older drainage infrastructure, will be most susceptible to this dynamic. Westport's Saugatuck River corridor is a specific area where rainfall-driven and riverine flood risk overlap significantly.

Riverine Flooding

Darien, Greenwich, and Westport contain riverine floodplain areas delineated in FEMA FIRMs. Westport faces the most significant riverine flood exposure through the Saugatuck River system, which drains a substantial inland watershed and is subject to both upstream rainfall-driven flooding and downstream tidal influences. Greenwich and Darien contain smaller coastal stream systems with more localized but still meaningful floodplain exposure. As with all coastal communities, compound flooding is a defining risk characteristic. When storm surge or extreme high tides coincide with intense inland rainfall, tidal backflow blocks drainage outfalls and forces water upstream. Development within and adjacent to floodplains in all three communities continues to place high-value assets at risk, and current flood maps may understate actual exposure given compound flood dynamics and ongoing sea level rise.

Coastal Flooding

Coastal flooding is the primary hazard distinction of Coastal-Moderate communities and encompasses storm surge, sea level rise, and saltwater intrusion.

Storm Surge

Darien, Greenwich, and Westport are directly exposed to storm surge from tropical and mid-latitude cyclones. All three communities contain low-lying coastal neighborhoods, beach and harbor areas, marina infrastructure, and waterfront residential development where surge events cause significant inundation. Greenwich's extensive coastline and numerous coastal inlets create exposure to surge penetration inland. Existing coastal protective structures across all three communities were designed for historical conditions and will require assessment as sea levels rise.

Sea Level Rise

Rising baseline water levels are already measurable along the Connecticut coastline and will continue to increase. Low-lying coastal areas in Darien, Greenwich, and Westport that currently experience occasional tide or nuisance flooding will likely face increasing frequent and prolonged inundation. The high concentration of waterfront residential property in these communities means that sea level rise carries significant economic implications beyond immediate safety concerns that will likely impact property values, insurance availability, infrastructure development decisions, and the long-term viability of coastal development.

Saltwater Intrusion

As sea levels rise and surge events penetrate further inland, saltwater infiltrates freshwater aquifers, coastal soils, and wetland systems. Darien, Greenwich, and Westport contain ecologically sensitive tidal wetland systems that provide natural coastal buffering but their degradation through saltwater intrusion reduces natural coastal protection and increases infrastructure vulnerability. Greenwich in particular contains extensive coastal wetland systems whose long-term health is directly tied to the community's overall coastal resilience.

Extreme Heat

Darien, Greenwich, and Westport face lower extreme heat risk than Coastal-High communities due to lower development density, greater tree canopy coverage, and reduced urban heat island effect. However, extreme heat risk is not absent and will increase as regional temperatures risk. Vulnerable populations including elderly residents, outdoor workers, and lower-income households in less-canopied areas remain at risk during extended heat events. The lower social vulnerability profile of these communities means that adaptive capacity is generally higher as most households in these communities have access to air conditions and resources during extreme heat events. However, heat emergency planning and cooling resources should not be overlooked because overall vulnerability is lower than in urban centers. Extreme heat also interacts with drought conditions to stress residential and municipal landscapes and increase wildfire risk in vegetated areas.

Drought

Drought risk in Darien, Greenwich, and Westport is meaningful and increasing. Extended precipitation deficits stress water supply systems, degrade residential and municipal landscaping, compromise the ecological function of coastal wetlands, and elevate wildfire ignition risk during dry high-wind events. All three communities rely on water supply systems sensitive to prolonged precipitation deficits, and increasing summer dry periods will place growing pressure on supply reliability. The extensive coastal wetland systems in these communities are particularly sensitive to drought-driven ecological stress. Reduced freshwater input during drought periods alters salinity balances in tidal wetland systems, affecting habitat quality and the natural buffering function these systems provide. Water supply vulnerability assessment and wetland health monitoring should both be incorporated into planning frameworks for these communities.

Wildfire

Darien, Greenwich, and Westport contain more vegetated land cover than Coastal-High communities, with residential development embedded in wooded suburban landscapes across significant portions of all three towns. This creates meaningful urban-wildland interface exposure, particularly in inland and northern portions of each community where forest cover is more extensive. During drought conditions and dry high-wind events, vegetated areas in all three communities can support fire ignition and spread. Wildfire risk in these communities is primarily a function of the interface between residential development and forested or shrubland areas, combined with the compounding effect of drought and extreme heat. Defensible space management, community wildfire protection planning, fuel load management, and coordination with local fire departments on wildfire preparedness are appropriate planning responses for all three communities.

Inland-High

Danbury is the sole Inland-High municipality within WestCOG and presents a distinct risk profile from other communities. As the region's largest inland city, Danbury combines high development density, significant impervious surface coverage, aging infrastructure, and the region's third-highest concentration of socially vulnerable populations with an inland position that eliminates coastal hazard exposure but introduces its own set of meaningful flood, heat, and storm risks. Danbury's risk profile is driven primarily by its urban characteristics, such as dense development, aging stormwater systems, and concentrated social vulnerability, rather than coastal proximity, and planning responses must reflect that distinction.

Watershed Context

Danbury sits at a unique watershed position within WestCOG. The city spans portions of both the Housatonic and Hudson HUC-8 watersheds, with the Hudson watershed overlapping Danbury's western border. It is one of the only four WestCOG municipalities with this dual watershed characteristic, alongside Ridgefield, New Fairfield, and Sherman. The majority of Danbury drains through the Housatonic watershed via the Still River, which flows through its city center and is a primary driver of riverine flood risk. The Still River corridor has a well-documented history of flooding, and its watershed is heavily influenced by Danbury's high impervious surface coverage upstream. Short, steep tributary streams draining Danbury's developed hillsides deliver runoff rapidly to the Still River during rain events, producing flashy, intense flood responses. The western portions of the city draining to the Hudson watershed experience somewhat different hydrological dynamics but face comparable flood risk driven by the same urbanization pressures.

Hazard Risk Profile

Extreme Storm Events

Danbury shares regional exposure to tropical cyclones, nor'easters, and severe thunderstorms with all WestCOG municipalities. As an inland community, Danbury does not face storm surge, but its urban density and topographic position amplify the impacts of extreme rainfall and high wind in ways that distinguish it from lower-density inland communities. Due to Danbury's position at higher inland elevations, it experiences a slightly greater probability of severe thunderstorms due to orographic lift effects, where moist air is forced upward over higher terrain, increasing convective activity and rainfall intensity. High winds associated with both tropical and mid-latitude events in spring represent a compounding wildfire risk in vegetated areas. Extended power outages during major storm events disproportionately affect Danbury's socially vulnerable populations, who face greater barriers during and after major events.

Rainfall-Driven Flooding

Danbury faces significant rainfall-driven flooding risk driven by high impervious surface coverage throughout the city. When rainfall exceeds the capacity of aging drainage infrastructure, which is increasing as storm events intensity, water accumulates rapidly in low-lying neighborhoods. Danbury's topography compounds this dynamic as steep hillsides throughout the city accelerate runoff, which concentrates flood impacts along valley bottoms and along stream corridors. Since Danbury's stormwater infrastructure was designed for historical rainfall conditions, chronic street flooding and localized inundation occur regularly in vulnerable areas. As precipitation becomes more intense and episodic, the gap between infrastructure capacity and storm loads will widen.

Riverine Flooding

Danbury faces the most significant riverine flood exposure of any inland WestCOG municipality, driven primarily by the Still River corridor that runs through the city center. Population centers adjacent to the Still River's 1% and 0.2% annual chance floodplains are at elevated and ongoing risk, and the river's history of flooding is well-documented in FEMA FIRMs and local flood records.

High impervious surface coverage through Danbury's watershed accelerates runoff delivery to the Still River and its tributaries, raising water levels rapidly during rainfall events and increasing the frequency and severity of flash flooding. Urbanized sub-basins contribute disproportionately to flood peaks, and even moderate rainfall events can produce significant riverine floodings if soils are saturated from prior precipitation events. Unlike coastal communities, Danbury does not face compound flooding from tidal backflow. However, the Still River's position in a relatively confined valley corridor means that floodwaters can spread into developed areas during major events, affecting residential neighborhoods, commercial areas, and transportation infrastructure.

Coastal Flooding

Danbury has no exposure to coastal flooding. As an inland community with no tidal of coastal connectivity, storm surge, sea level rise, and saltwater intrusion are not applicable hazards. Danbury's flood risk is driven by rainfall and riverine dynamics as discussed above.

Extreme Heat

Danbury faces the region's highest inland extreme heat risk, driven by the same urban heat island dynamics present in Stamford and Norwalk. High concentrations of impervious surfaces, dense buildings, and limited tree canopy in lower-income neighborhoods elevate ambient temperatures significantly above surrounding suburban and rural communities. As regional temperatures rise, heat waves will become more frequent, longer in duration, and more intense. Danbury's socially vulnerable population, such as elderly residents, people with chronic health conditions, and outdoor workers, face the greatest risks to extreme heat.

Power grid stress during extended heat events is a particular concern for Danbury as well. High cooling demand can produce outages when relief infrastructure is necessary, which can have cascading consequences for vulnerable populations, critical facilities, and food security. Extreme heat also compounds with other hazards like worsening air quality through increased ground-level ozone formation and contributing drought conditions that stress urban vegetation and increase wildfire ignition risk at the urban fringe.

Drought

Danbury faces meaningful drought risk that intersects with and amplifies several other hazards in its risk profile. Extended precipitation deficits, accelerated by higher temperatures and increased evapotranspiration demand, can stress water supply systems, degrade urban vegetation, reduce stream baseflows in the Still River and its tributaries, and elevation wildfire ignition risk. Danbury's water supply infrastructure, which serves a large urban population, is sensitive to prolonged precipitation deficits. As summer dry periods lengthen and demand increases with rising temperatures, water supply variability will require proactive planning and investment. Reduced stream baseflows during drought periods also concentrate pollutants in the Still River and its tributary systems, affecting water quality downstream through the Housatonic watershed.

Urban tree canopy in Danbury's lower-income neighborhoods, which tends to be lower than in higher-income areas, is particularly vulnerable to drought stress. Protecting and expanding tree canopy in these areas requires proactive drought resilience planning, species diversification, and maintenance. Drought conditions also interact with extreme heat to create compounding public health risks for Danbury's most vulnerable residents.

Wildfire

Wildfire is not a primary hazard for Danbury's urban center but is more relevant at the city's suburban and rural fringes, where residential development interfaces with forested and shrubland areas. During drought conditions and dry high-wind events, which are both increasing in frequency, vegetated areas can support fire ignition and spread. The city's topography, with steep wooded hillsides adjacent to residential neighborhoods, creates conditions where fire can spread upslope during high wind events. Wildfire risk in Danbury is best understood as an urban-wildland interface issue concentrated in outer neighborhoods, which can be managed through vegetation management and coordinate with local fire departments on wildfire preparedness planning. As drought frequency increases, the window of elevated wildfire risk will extend across a greater portion of the calendar year.

Inland-Moderate

The Inland-Moderate communities represent the largest community category within WestCOG, encompassing nine municipalities that share a broadly similar risk profile defined by moderate development density, predominantly suburban and forested land cover, and an inland position that eliminates coastal hazard exposure. These communities consist of Bethel, Brookfield, New Canaan, New Fairfield, New Milford, Newtown, Ridgefield, Weston, and Wilton. These communities are characterized by a mix of developed town centers, residential subdivisions, and extensive forested and wetland landscapes that together create a risk profile meaningfully different from the other WestCOG communities.

While the absence of coastal exposure removes one of the most acute hazard categories, Inland-Moderate communities are not low-risk. Riverine flooding along the Housatonic River system and its tributaries, increasing extreme heat in developed centers, growing wildfire risk in forested landscapes under drought conditions, and the compounding effects of intensifying precipitation events all represent genuine and increasing planning challenges. The diversity in this community category, which ranges from the more developed southern towns of New Canaan and Wilton to the more rural northern communities of New Fairfield and Ridgefield, means that while the category-level risk profile is broadly shared, individual municipalities have individualized and specific local conditions that are discussed below.

Watershed Context

The Inland-Moderate communities fall primarily within the Housatonic HUC-8 watershed, which drains the majority of inland WestCOG through the Housatonic River and its extensive tributary network. New Fairfield and Ridgefield are notable exceptions, with portions of their western borders overlapping the Hudson HUC-8 watershed. This distinction influences drainage patterns, flood dynamics, and the downstream implications of local land use decisions in those communities.

The Housatonic watershed is characterized by a network of rivers, streams, and wetland systems that provide meaningful natural flood attenuation capacity across the region. Lake Lillinonah and Candlewood Lake, located within New Fairfield and Brookfield, are significant hydrological features within this watershed that influence local flood dynamics, water supply, and ecological function.

The more developed southern Inland-Moderate communities – New Canaan, Wilton, and Weston – have higher impervious surface coverage than their norther counterparts, producing somewhat flashier runoff responses and greater stormwater management challenges. The more rural communities – New Fairfield, Ridgefield, and portions of Newtown and Brookfield – retain more natural infiltration capacity but face growing development pressure that may reduce that capacity over time. Watershed-level land use decisions, riparian buffer protection, and wetland conservation are foundational tools for maintaining natural flood attenuation across the Inland-Moderate communities.

Hazard Risk Profile

Extreme Storm Events

All Inland-Moderate communities share regional exposure to tropical cyclones, nor’easters, and severe thunderstorms. As inland communities, none face storm surge, but extreme rainfall and high winds from all storm types produce meaningful impacts across this community category. Inland communities at higher elevations experience slightly greater probability of severe thunderstorm occurrence due to orographic lift effects, and the forested landscapes of many Inland-Moderate communities create significant wind damage risk from downed trees during major storm events, which can impact power infrastructure, roads, and structures.

Nor’easters are particularly impactful for this community category. Winter and spring storms bring heavy snow and ice loading that stresses aging infrastructure, causes extended power outages, and creates dangerous travel conditions across the region’s rural road networks. Extended power outages in lower-density communities with fewer alterative shelter options represent a meaningful vulnerable population, particularly for elderly residents and households without backup heating capacities.

While social vulnerability is lower across most Inland-Moderate communities than in coastal cities and Danbury, localized concentrations of vulnerable populations in town centers and lower-income residential areas are important to consider.

Rainfall-Driven Flooding

Rainfall-driven flooding risk varies across Inland-Moderate communities in direction proportion to development density and impervious surface coverage. The more developed southern communities like New Canaan, Wilton, and Weston, face greater pluvial flooding risk than the more rural northern communities, with developed town centers and residential areas generating concentrated runoff that can overwhelm local drainage systems during high-intensity rainfall events.

Across all Inland-Moderate communities, the interaction between intense rainfall and the region's forested and wetland landscapes is an important dynamic. Forested watersheds absorb significant amounts of rainfall through infiltration and evapotranspiration, which reduces runoff volumes and flood peaks. However, when soils are already saturated from prior precipitation events, which is becoming common as rainfall becomes more episodic and intense, even forested watersheds can produce significant runoff.

Development within and adjacent to stream corridors in all Inland-Moderate communities continues to increase exposure to rainfall-driven flooding. Stormwater management standards that were designed for historical rainfall conditions will increasingly be tested as precipitation intensity rises, which should be considered in stormwater regulation and planning.

Riverine Flooding

Riverine flooding is the most significant and consistently present flood hazard across Inland-Moderate communities. The Housatonic River and its extensive tributary network, which includes the Still River, Pomperaug River, Shepaug, River, and numerous smaller streams, flow through or adjacent to many of these communities and FEMA-delineated floodplains along these corridors represent ongoing and well-documented flood risks.

New Milford faces particularly significant riverine flood exposure at the confluence of the Housatonic and Still Rivers, where flood peaks from both systems can compound during major rainfall events. Brookfield and Newtown contain significant floodplain areas along the Still River and its tributaries. New Fairfield's position by Candlewood Lake introduces a managed reservoir dynamic where flood risk is important to operational decisions and natural hydrology. Ridgefield and portions of New Canaan drain to smaller coastal stream systems with localized but important floodplain exposure.

Unlike coastal communities, Inland-Moderate communities do not face compound flooding from tidal backflow. However, the intensification of rainfall projected under future climate conditions will increase flood peak magnitudes across all river systems, potentially inundating mapped floodplains. FEMA FIRMs should be treated as a baseline for flood risk assessment and communities should evaluate development proposals against future climate projects as well as historical floods in tandem.

Coastal Flooding

Inland-Moderate communities have no exposure to coastal flooding. Storm surge, sea level rise, and saltwater intrusions are not applicable hazards for any municipality in this category. Flood risk in these communities is driven by rainfall and riverine dynamics as addressed above.

Extreme Heat

Extreme heat risk across Inland-Moderate communities is lower than in coastal areas but is increasing. Developed town centers in New Canaan, Wilton, Weston, and other communities with higher impervious surface coverage experience localized urban heat island effects that elevate temperatures above surrounding forested landscapes. As regional temperatures rise, heat waves will become more frequent and intense across all community types, regardless of development intensity.

The more rural and forested Inland-Moderate communities benefit from greater tree canopy coverage and lower impervious surface density, which moderates heat exposure relative to urban centers. However, vulnerable populations still remain at risk even in lower-density communities. The interaction between extreme heat and drought is particularly relevant for this community category, where forested landscapes and agricultural areas are sensitive to compounding temperature and precipitation stress.

Drought

Drought is a relevant and growing hazard for Inland-Moderate communities, with implications for water supply, agricultural and forested landscapes, stream ecology, and wildfire risk. Extended precipitation deficits, amplified by higher temperatures increasing evapotranspiration demand, reducing stream baseflows and stress water supply systems, and degrading the ecological function of wetland systems of this community category.

Candlewood Lake, as a managed reservoir serving water supply and recreational functions for New Fairfield, Brookfield, and surrounding communities, is particularly sensitive to extended drought conditions. Reduced inflows during drought periods affect both reservoir levels and the downstream ecological function of the Housatonic River system. Water supply vulnerability assessment under projected drought scenarios should be a planning priority for communities dependent on reservoir and stream-based water supply systems.

Forested landscapes across Inland-Moderate communities, which are a significant portion of total land cover, are sensitive to drought stress, with implications for forest health, wildlife habitat, carbon sequestration, and wildfire risk. Extended dry periods increase fine fuel loads and moisture stress in forested areas, creating conditions where ignition risk is elevated across a larger portion of the landscape for longer periods of the year.

Wildfire

Inland-Moderate communities face the most significant wildfire risk of any of the WestCOG communities outside of Inland-Low, driven by extensive forested and shrubland landscapes. The interface between residential development and forested land cover, present across all nine towns in this community category, creates urban-wildlife interface conditions where fire ignition from human or natural sources can spread into residential areas under the right conditions.

Drought conditions and dry high-wind events are the primary triggers for elevated wildfire risk across this community category. Extended drought dries fine fuels – leaf litter, understory vegetation, and stressed or dead trees – while high-wind events provide ignition spread across these forested landscapes. The combination of these conditions, both of which are projected to increase in frequency, will extend the window of elevated wildfire risk across a greater period of time during the year.

New Fairfield, Ridgefield, Sherman's border communities, and the more rural portions of Newtown and Brookfield face the highest wildfire exposure within this category due to their greater forested land cover and lower development density, which means fires can travel further before encountering developed areas. The more developed southern communities, New Canaan, Wilton, and Weston, face lower but still somewhat significant wildfire risk specifically at the interface between their residential and forested boundaries. Community wildfire protection planning, fuel load management, and coordination with local fire departments on wildfire preparedness are appropriate and required for planning responses in this community.

Inland-Low

Bridgewater, Redding, and Sherman are the least densely developed municipalities within WestCOG and represent a risk profile that is fundamentally shaped by their rural, forested landscapes. Low impervious surface coverage, extensive natural land cover, minimal concentrated development, and small resident populations distinguish these communities from all other WestCOG categories. The absence of coastal exposure and urban density removes many of the region's most acute hazard drivers, but Inland-Low communities are not without meaningful climate risks. Wildfire, riverine flooding, drought, and the intensification of extreme storm events all represent growing planning challenges for communities whose infrastructure, emergency response capacity, and planning resources are more limited than other communities.

The planning context for Inland-Low communities varies as there are smaller municipal staffs, more constrained budgets, and less planning capacity than larger municipalities, yet these communities also steward some of the region's most ecologically valuable landscapes like forested watersheds, inland wetlands, and riparian corridors that are vital to natural flood attenuation, water quality, carbon sequestration, and habitat benefits that extend well beyond their municipal boundaries. Climate resilience planning in Bridgewater, Redding, and Sherman must therefore balance locally focused hazard mitigation with recognition of the broader regional ecological value these communities provide and protect.

Watershed Context

Bridgewater, Redding, and Sherman fall primarily within the Housatonic HUC-8 watershed, with Sherman's western border overlapping with the Hudson watershed. The Housatonic River forms the western boundary of Bridgewater and flows adjacent to portions of Sherman, representing the primary riverine flood risk corridor for both communities. Redding drains primarily through the Saugatuck River system, which flows southward through Westport to the Long Island Sound, connecting Redding's inland hydrology to the coastal flood dynamics of Coastal-Moderate communities downstream.

The watersheds of all three communities retain high levels of natural land cover, with forested uplands, inland wetlands, and intact riparian buffers providing substantial natural flood attenuation capacity. This region is substantially hydrologically intact with significant land conservation and any incremental loss of natural land cover in these communities may have disproportionate consequences for downstream flood risk, water quality, and ecological function across the broader watershed.

Hazard Risk Profile

Extreme Storm Events

Bridgewater, Redding, and Sherman share regional exposure to tropical cyclones, nor'easters, and severe thunderstorms with all WestCOG municipalities. As inland communities at higher elevations, all three experience slightly elevated probabilities of severe thunderstorms due to orographic lift effects. The extensively forested landscapes of all three communities create significant wind damage risk which can impact power infrastructure, roads, and structures. The low road network density in these communities also means downed trees or power lines can isolate neighborhoods or hamper emergency responses easily.

Nor'easters are particularly impactful for Inland-Low communities. Heavy snow and ice loading during winter and spring storms may cause extended power outages across rural road networks that are more difficult and time-consuming to restore than in denser communities. The limited availability of alternative shelter options and the greater distance between residents and emergency services in these communities means that extended outages carry greater consequences and risks than equivalent events in more densely developed areas.

The small resident populations and limited municipal infrastructure of these communities mean that storm impacts, while potentially less widespread than in urban areas, can be proportionally severe. Emergency response capacity may be more constrained and recovery timelines can be longer if resources are limited, which should inform emergency management planning and investment planning for these communities.

Rainfall-Driven Flooding

Rainfall-driven flooding risk in Inland-Low communities is lower than in any other WestCOG community category, driven by the high proportion of natural land cover that absorbs and slows rainfall before it reaches stream systems. Forested uplands, intact wetlands, and permeable soils across Bridgewater, Redding, and Sherman provide natural infiltration capacity that dramatically reduces runoff volumes relative to overly developed communities.

However, rainfall-driven flooding is not absent. Developed areas in each community's town center, where impervious surfaces are most concentrated, can experience localized runoff and drainage challenges during high-intensity rainfall events. As precipitation becomes more frequent and intense under future climate projections, these communities will likely face increasing stormwater management challenges. Road drainage infrastructure, culverts, and small bridges throughout these communities are particularly vulnerable to high-intensity rainfall events, where undersized structures can fail or become blocked. Maintaining and protecting natural land cover is the most effective rainfall-driven flood mitigation strategy available to these communities. Land conservation, wetland protection, and riparian buffer preservation should be treated as stormwater infrastructure investments, not just ecological amenities.

Riverine Flooding

Riverine flooding is the most significant flood hazard for Inland-Low communities, driven by the Housatonic River corridor adjacent to Bridgewater and Sherman, and the Saugatuck River system draining through Redding. FEMA-delineated floodplains along these river corridors represent ongoing and well-documented flood risk, and the limited development within these floodplains reflects both historical awareness of flood risk and the low overall development density of these communities.

The Housatonic River is a large, regionally significant river system whose flood behavior is influenced by conditions across a vast upstream watershed extending beyond WestCOG's boundaries. Major flood events on the Housatonic are driven by regional rainfall patterns and upstream watershed conditions that Bridgewater and Sherman cannot control through local planning alone. Coordination with state agencies, upstream municipalities, and the broader Housatonic watershed management community is therefore an important component of flood risk management for these communities.

Redding's position as an upstream community within the Saugatuck River watershed means that land use and stormwater management decisions made in Redding have direct downstream consequences for flood risk in Westport. This upstream-downstream relationship is an important regional planning consideration and reinforces the value of maintaining natural land cover and riparian buffers throughout Redding's watershed. As with all inland communities, FEMA FIRMs should be treated as a baseline for flood risk assessment with an understanding that intensifying precipitation under future climate projections will increase flood peak magnitudes across all river systems.

Coastal Flooding

Inland-Low communities have no exposure to coastal flooding. Storm surge, sea level rise, and saltwater intrusion are not applicable hazards for Bridgewater, Redding, or Sherman. Flood risk in these communities is driven by rainfall and riverine dynamics as addressed above.

Extreme Heat

Extreme heat risk in Inland-Low communities is the lowest of any WestCOG community category. Extensive forest cover, high tree canopy, low impervious surface coverage, and minimal urban heat island development moderate heat exposure relative to other community categories. The natural cooling provided by forested landscapes represents an important climate resilience asset that these communities should actively protect.

However, extreme heat risk is not entirely absent as regional temperatures rise regardless of land cover. Vulnerable populations remain at risk during extended heat events and the greater distances between residents and cooling resources in these communities mean that access to heat relief is more challenging than in more densely populated communities. Forest health is also a meaningful heat-related concern for these communities as periods of elevated temperatures stress forest ecosystems and can interact with drought to elevate wildfire risk.

Drought

Drought is a significant hazard for Inland-Low communities, with implications that extend across water supply, forest health, stream ecology, agricultural landscapes, and wildfire risks. Extended precipitation deficits, amplified by higher temperatures, reduce stream flows and stress private well water supplies that many rural residents depend on, degrade wetland function, and create conditions that dramatically elevate wildfire risk across the region's most extensively forested landscapes.

Private well dependency is a distinct drought vulnerability for Inland-Low communities. Unlike urban and suburban communities served by municipal water systems with greater storage and supply redundancy, many residents of Bridgewater, Redding, and Sherman rely on private wells that are directly sensitive to groundwater levels. Extended drought periods that drawn down groundwater tables can render private wells inadequate or dry, creating immediate water supply crises for individual households with limited alternatives.

Forest health across all three communities is sensitive to drought stress. Extended dry periods increase tree mortality and create fine fuel conditions that dramatically elevate wildfire ignition and spread risk. The interaction between drought and wildfire is the defining compound hazard relationship for this community category and warrants integrated planning across both hazard domains.

Wildfire

Bridgewater, Redding, and Sherman face the highest wildfire risk of any community within WestCOG. Extensive forested land cover, high fine fuel loads, low road network density, limited firefighting resources, and increasing drought frequency all combine to create a high-risk wildfire profile. Wildfire ignitions occur in Connecticut's forested landscapes regularly, and the conditions that drive large fire events are becoming more frequent.

Drought conditions and dry high-wind events are the primary triggers for elevated wildfire risk, and both are projected to increase in frequency and intensity under future climate conditions. Extended drought dries fine fuel loads across landscapes, while high-wind events provide ignition spread rapidly through forested areas. The combination of these conditions can produce fire behavior that overwhelms local suppression capacity, particularly in communities with limited firefighting resources and long response times.

The interface between residential development and forested land cover creates urban-wildlife interface conditions where fire can threaten structures, complicate evacuation, and endanger residents. Low road network density in these communities also means that evacuated routes may be limited and could threaten to isolate neighborhoods. Emergency planning for wildfire scenarios must address evacuate route vulnerabilities and potential for road closure across access points in case of wildfire threat.

Sherman and Redding face particularly high wildfire exposure due to their extensive forested land cover and low development density. Bridgewater has somewhat lower exposure due to its smaller total land area. All three communities should treat wildfire as a primary planning hazard and pursue wildfire protection planning, vegetation management, and active coordination and wildfire threat and planning.

Planning Recommendations

The hazard risk profiles establish a clear, community-differentiated foundation for climate resilience planning across WestCOG. The recommendations that follow are organized around the planning initiatives that typically follow a POCD update. These are general planning guidance based on the community profiles discussed above. The goal is not to prescribe identical action across all 18 municipalities, but to ensure each community has a clear, risk-grounded basis for planning decisions.

Zoning and Land Use

- Coastal-High and Coastal-Moderate communities should restrict development intensification in mapped floodplains and sea level rise inundation zones, incorporate or enforce freeboard requirements calibrated to projected sea level rise, strengthen coastal buffer and setback zones, and integrate climate risk screening into site plan and subdivision review.
- Inland-High and Inland-Moderate communities should update stormwater and impervious surface standards to reflect projected rainfall intensification, protect riparian buffers and wetland systems through zoning overlays, and evaluate development proposals in and adjacent to floodplains against future climate projections rather than historical flood records alone.
- Inland-Low communities should prioritize conservation zoning and natural land cover protection as their primary resilience tool, recognizing that forested watersheds, wetlands, and riparian buffers provide flood attenuation and water quality benefits that extend beyond municipal boundaries.
- Inland-High and Coastal-High communities should incentivize an increase in urban tree canopy and a reduction of impervious surface cover to reduce the heat-island effect.

Infrastructure

- Coastal-High communities should commission compound flood vulnerability assessments, conduct condition evaluations of coastal protective structures against projected sea level and surge conditions, and prioritize stormwater capital investment in the highest-risk and most socially vulnerable neighborhoods.
- Coastal-Moderate communities should focus compound flood assessment on key river corridors and evaluate coastal protective infrastructure against projected future conditions.
- Inland-High communities should prioritize stormwater infrastructure upgrades in socially vulnerable neighborhoods, address aging systems designed for historical rainfall conditions, and expand green infrastructure to reduce impervious surface runoff.
- Inland-High Danbury should prioritize funding and implementation or the CIRCA Resilient Danbury study for both rainfall flooding and extreme heat.
- Inland-Moderate and Inland-Low communities should assess road drainage infrastructure, culvert adequacy, and small bridge capacity under projected future rainfall conditions, and evaluate water supply vulnerability under drought scenarios, especially communities dependent on reservoir or private well systems.

Coastal Resilience

- Coastal-High communities should update coastal resilience plans incorporating current sea level rise projections, storm surge modeling, and compound flood analysis, prioritizing nature-based investments like wetland restoration, living shorelines, beach and dune rehabilitation, alongside engineered protection, and developing frameworks for managing the most exposed coastal properties/areas.
- Costal-High and Coastal-Moderate communities should approach coastal resilience as an integrated

system that incorporates tidal wetland health, saltwater intrusion, and engineered coastal protection as interdependent variables to be planned for in tandem.

- All coastal communities should coordinate with CT DEEP on coastal management permitting, shoreline change monitoring, state coastal resilience funding, and update coastal resilience plans with up-to-date sea level rise projections.

Wildfire and Forest Management

- Inland-Moderate communities should assess wildfire interface risk where residential development neighbors forested land cover and establish defensible space standards in coordination with local fire departments.
- Inland-High, Inland-Moderate, and Inland-Low communities should treat wildfire as an emerging primary planning hazard, pursuing Community Wildfire Protection Plans and vegetation management along road and utility corridors, and coordination with CT DEEP and local fire departments on suppression capacity and aid.
- Inland-Moderate communities should assess wildfire interface risk where residential development neighbors forested land cover and establish defensible space standards in coordination with local fire departments.
- All communities should recognize the compounding relationship between drought and wildfire and incorporate both into integrated hazard planning.

Emergency Management

- All coastal communities should regularly review evacuation route vulnerability to coastal flooding and storm surge, encourage or require applicable critical facilities to have current flood vulnerability assessments and continuity of operations plans, and coordinate with CT DEEP, FEMA, and adjacent municipalities on regional storm response planning, including enhancing or developing emergency warning and notification systems.
- Inland-High communities should ensure emergency communication systems and shelter locations are accessible to all residents, with targeted outreach to socially vulnerable populations facing the greatest barriers to timely response.
- Inland-Low communities should develop mutual aid frameworks that account for simultaneous multi-community impacts during major storm or wildfire events and ensure residents dependent on private wells have access to an emergency water supply during drought emergencies.
- All communities should maintain current, accessible emergency communication systems and identify community spaces that can serve as cooling centers, emergency centers, and information distribution points during major climate events.
- All communities should establish or maintain public education and preparedness programs that equip residents, workers, and visitors with the knowledge, tools, and motivation needed to understand local hazard and climate risks and to take meaningful individual action that reduces vulnerability. These programs should be ongoing, multilingual, and accessible to all.