**4-2: Extreme Heat**

This chapter aims to address the history, trends, vulnerability and mitigation efforts associated with extreme heat, prolonged hot weather and rising average annual temperatures. More information on increasing average temperatures can be found in the Climate Change subsection of the Hazard Assessment and reflected in the trends and vulnerabilities sections of each hazard profile.

Extreme hot temperatures can have significant effects on human health and commercial and agricultural businesses, as well as primary and secondary effects on infrastructure (e.g. damage to asphalt roadways from softening). What constitutes “extreme heat” can vary across different areas of the world based on what the population is accustomed to in their respective climates. An example of this difference in acclimatization can be understood when comparing analyses of excess mortality due to heat: in New York City, the data show that the heat index threshold needs to reach at least 95°F to measure a significant rise in heat-related mortality, whereas the threshold in Montreal, Canada, only 400 miles north, is 91°F and did not need to factor in heat index. Epidemiological analyses completed by the Vermont Department of Health indicate that heat-related health impacts in Vermont substantially increase when the heat index exceeds the historic 95th percentile threshold, which is about 90°F in hotter areas like Burlington and about 85°F in cooler places like Newport.

Temperature fluctuations are a result of several meteorological processes[[1]](#footnote-2). Due to the tilt of Earth’s axis, regions of the globe receive varying levels of solar radiation. The delta between these levels produces circulation patterns at the global level, which drive air and storm system movement via air masses. Air masses, as defined by NOAA, are thousands of feet thick and extend across large areas of the earth. Air masses that form over tropical ocean regions will become exceptionally hot and humid, while those masses above high latitude continents will become cool and dry. When these air masses meet, a front is created; fronts can either be cold or warm. In addition to these air mass and front-related impacts humans feel at ground level, movement of narrow bands of strong wind high in the atmosphere, known as jet streams, maneuver weather systems below and transfer heat and moisture across the globe. The speed and intensity of the jet stream will affect the duration and temperature associated with a cold or warm front.

Extremely high temperatures can occur when a high-pressure system (under which air is descending toward the Earth’s surface) develops and intensifies. Under such conditions, the potential for a heat wave exists. A heat wave is a period of three or more consecutive days during which the maximum temperature meets or exceeds 90°F.

In anticipation of extreme heat events, the National Weather Service (NWS) may issue the following advisories in Vermont:

* **Excessive Heat Outlook:** A period of excessive heat is possible within the next 3 to 5 days.
* **Heat Advisory – Take Action:** A period of excessive heat is expected. The combination of hot temperatures and high humidity will create a situation in which heat related illnesses are possible. Heat Advisories are issued when heat indices are expected to reach at least 95°F.
* **Excessive Heat Watch:** A prolonged period of dangerous excessive heat is possible within about 48 hours
* **Excessive Heat Warning – Take Action:** A prolonged period of dangerous excessive heat is expected within about 24 hours. The combination of hot temperatures and high humidity will create a situation in which heat related illnesses are possible. Excessive Heat Warnings are issued when heat indices are expected to reach at least 105°F.

The Heat Index is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature (Figure 47). For example, if the air temperature is 90°F and the relative humidity is 65%, the heat index – how hot it feels – is 103°F. The red area without numbers indicates extreme danger. The National Weather Service will initiate alert procedures when the Heat Index is expected to exceed 105°F (depending on local climate) for any duration[[2]](#footnote-3). Full sun can increase the “feels like" temperature by an additional 15 degrees.

Extreme heat and prolonged periods of hot weather, as well as significant, projected increases in average annual temperature, also have direct and indirect effects on other hazards, addressed throughout this Plan: Drought, Wildfire, Invasive Species, Infectious Disease.

[Fig 47, heat index NOAA]

Location

Urbanized areas in Vermont experience higher temperatures than more rural areas of Vermont, particularly during summer months. Data collected by citizen scientists during a 2020 Heat Watch Campaign in urbanized Chittenden County indicated a nearly 10°F difference on a hot August day between the most developed and most natural areas of the study area.[[3]](#footnote-4) The data were then used to estimate that all urban areas in Vermont experience similar temperature variation, and even small urban areas in Vermont experience at least a 3°F difference.[[4]](#footnote-5) The Urban Heat Island (UHI) Effect describes this phenomenon, as areas covered by pavement, rooftops, or other dark, impervious surfaces absorb and retain more heat than do trees and vegetative surfaces[[5]](#footnote-6)￼. People, vehicles, and other technology also create waste heat that is released into the surrounding area and increases the UHI effect, especially in densely [[6]](#footnote-7)￼. Urban heat islands also raise concerns about health equity and climate justice, as residents of the hottest neighborhoods with the least tree cover often experience additional heat-related health risk factors and have fewer resources for adapting to hot weather.

Extreme Heat History

Fortunately, Vermont has historically experienced a climate where extreme heat is less likely than other regions in the country. However, our cool climate contributes to greater risk when it does get hot, as it takes time for a person’s body to acclimate to activity during hotter weather, and many buildings in Vermont do not have air conditioning. Heat-related events are beginning to occur in Vermont in much greater frequency and intensity (see Extreme Heat Trends). In Burlington, the most recent 5-year average number of days per year with above 90°F temperatures is nearly 12, compared to only 6 days on average between 1991-2020[[7]](#footnote-8). In 2020, a year when more than half the state experienced moderate-to-severe drought, this figure climbed to 18. Extreme maximum temperatures are often observed during drought years, and in many cases, the records that are broken were long-standing and set during previous droughts (see: Drought).

Between 2000 and 2022, the number of recorded days per year with a daily temperature high greater than or equal to 90°F peaked during 2020 in Burlington at 18 days, closely followed by 2018 with 16 days[[8]](#footnote-9). It is important to note here, however, that hot weather can have health impacts at even lower temperatures, with health risks increasing considerably when temperatures reach the mid-to-upper 80s[[9]](#footnote-10).

One summer excessive heat event was recorded by NOAA in Vermont on July 1, 2018 in Bennington and Windham Counties. Temperatures were recorded in the mid-90s with heat indices registering at 105 degrees. While excessive heat was only recorded in Bennington and Windham Counties, all 14 Vermont counties were significantly impacted by this heat event. The July 1, 2018 heat event throughout Vermont, along with other significant events since 2000 are included below.

* **August 1-2, 2006:** A heat ridge moved into Vermont during the early morning August 1. Temperatures soared into the 90s but significantly more important were dewpoints that reached the middle to upper 70s to produce excessive heat index values of 100°F to 105°F, some of the highest values in nearly a decade.
* **July 21, 2011:** Temperatures across much of southern Vermont warmed into 90s with dew points in the 70s, combined with the hot temperatures and resulted in heat indices of 100°F to 104°F. This was the 2nd day of a 3 to 4-day heat wave across a large portion of Vermont with heat index values of 100°F to 108°F across the Champlain and Connecticut valleys as well as some interior valleys. One death is attributed to this event in Windsor County.
* **March 17, 2012:** Winter of 2011-12 had temperatures that averaged 4-5°F above normal and snowfall 40-60% of normal. This combination accounted for snow pack across the region to be largely below normal or even non-existent by mid-March. In Vermont, temperatures climbed into the 70s March 18 and low-80s March 19-22. Record heat was recorded across all of Vermont with maximum temperatures 30-40°F above normal and some daily records being broken by 10°F or more. This event caused an estimated reduction of 30% of maple sugar production, resulting in an estimated impact of nearly $10 million. In addition, there was significant loss of ski industry revenue due to a 25-50% reduction in snow loading.
* **July 1, 2018:** High temperatures affected zones in all 14 of Vermont’s counties through Independence Day. Temperatures reached the mid-90s, and heat indices were recorded within the range of 95 -110 degrees. The heat wave continued for 6 consecutive days, and Burlington, VT saw the warmest 5 day stretch since 1892. It is important to note that the all-time minimum temperature also broke a previous record of 78 degrees, on July 2nd, 2018 at 80 degrees. Four deaths were attributed to this event, one recorded in Washington County and three in Chittenden County, all related to excessive indoor residential temperatures. Nearly 100 heat-related emergency department visits occurred state-wide during this heat wave, and more than 10 percent of Emergency Medical Service calls on July 1st were heat related.
* **June 18, 2020:** Areas of Vermont and New York experienced the 2nd longest heatwave duration with temperatures in the 90s for six days straight in northwestern Vermont. Burlington recorded the highest temperature in its history on June 22nd and 23rd with a reading of 96 degrees. Zones in 8/14 of Vermont’s counties recorded high temperatures during this period of time. One death in Orleans County was associated with this heat wave.

Extreme Heat Trends

From 1895 to 2022, the average annual temperature in Vermont increased by 3.6°F (or 0.2°F per decade)[[10]](#footnote-11). Data from the National Oceanic and Atmospheric Administration (NOAA) further suggest that Vermont’s average annual maximum and minimum temperatures increased by approximately 0.4°F and 0.6°F, respectively, per decade since 1960[[11]](#footnote-12), representing an increasing trend in temperature increases within the State. This significant rise in average temperature is even more profound when comparing the differences between seasons: average maximum temperature in the summer (June-August) has risen 0.2°F per decade, while winter (December-February) has experienced an increase of 0.7°F per decade.

[Fig 48, VT average annual max and min temps]

Increases in ground surface temperatures will be further exacerbated by varying levels of greenhouse gases. Climatologists have modeled the projected increases in the number of days over 90°F for both reduced greenhouse gas emissions scenario (B1) and those increases in higher greenhouse gas emissions scenario (A2). This modeling suggests that increases in average temperature of 3°F to 6°F in the lower emissions scenario versus 4.5°F to 10°F under higher emissions conditions can be expected by the 2080s[[12]](#footnote-13) (Figure 49). The most significant warming in this region will occur during the winter months, where average temperatures are projected to increase by 4°F, while the increase in summer months will be less severe, at 2°F, but still considered a significant rise. More information for the compounding impacts of increasing gas emissions on increasing temperatures can be found in the 2018 National Climate Assessment[[13]](#footnote-14).

Considering the already-observed increase in average annual temperature, the projected rise between 3°F and 10°F by the 2080s, and the impacts of extreme heat or prolonged hot weather, the Steering Committee considered the probability of a plausibly significant extreme heat or prolonged hot weather event to be Highly Likely, with major impacts to people.

**Vulnerability**

**People**

The impact of extreme heat or prolonged periods of hot weather to human life is significant. Hot conditions, especially when combined with sun and high humidity, can limit the body’s ability to thermoregulate properly. Prolonged exposure to hot conditions can lead to heat cramps, heat exhaustion, heat stroke, or exacerbate other pre-existing medical conditions. Some of these impacts require medical attention and can be fatal.

Epidemiological analyses completed by the Vermont Department of Health indicate that Vermonters are five times as likely to visit the emergency department for heat-related illnesses when the heat index reaches the 80s, 10 times as likely when the heat index reaches the low 90s, and over 20 times as likely when the heat index reaches the upper 90s or hotter.[[14]](#footnote-15) These risks are greatly modified by how acclimated a person is to hot weather – the risk for heat-related health impacts is higher early in the heat season, and lower if it has been consistently hot over the past week or more. Consecutive days of hot weather with warm overnight temperatures further increase the risk of experiencing severe heat-related health impacts. Risk also depends on the “normal” level of heat experienced in an area – places that are relatively cooler will typically experience health impacts at lower heat index values than a place that is relatively warmer.

[Fig 50, Vermont heat emergencies]

Older adults, people with chronic health conditions, and people with disabilities are at particularly high risk, especially if they live in housing without air conditioning or are unhoused and cannot access cooling facilities and other support resources. The unhoused may not be or feel welcomed at cooling centers, sleep in hot tents, and carry heavy loads of their possessions in the heat.

Living alone or in an isolated location further increases risks for those who are already susceptible to heat. Other populations at relatively high risk include young children, people that are pregnant, outdoor workers and hobbyists, and people living in more urbanized parts of Vermont. For anyone, taking certain medications, drugs, and alcohol, can increase heat sensitivity.

The Vermont Department of Health developed a town-level Heat Vulnerability in Vermont report[[15]](#footnote-16) in 2016. The vulnerability index is composed of data representing six heat vulnerability themes (population demographics of a town, socioeconomic status, health status of town residents, environmental characteristics, the ability of town residents to acclimate to hot temperatures and emergency room visits for heat illness) with a thematic vulnerability calculated for each. The hot-weather vulnerability maps by theme, and more information regarding the health impacts of increasing temperatures and prolonged periods of hot weather are available at the Department of Health’s Climate & Health website: www.healthvermont.gov/environment/climate. Figure 51 shows the overall vulnerability scores across Vermont.

Though higher temperatures are more likely in the Champlain Valley, southeast region of the State, and in more urban areas, this does not translate to a linear relationship between temperature and vulnerability. Historically, relatively high rates of heat illnesses have been experienced in some of the cooler counties in Vermont, which may be a result of underlying population vulnerabilities (e.g., an older population with more pre-existing health conditions) or a lack of acclimation to hotter conditions. Most urban areas in Vermont do experience relatively higher rates of heat-related illnesses, with the exception of the Burlington area, which is likely related to this area having greater adaptive capacity in terms of material resources and cooling centers.

In addition to the direct health impacts associated with extreme heat, data suggest that other health impacts are also associated with prolonged hot weather and increasing average temperatures. For example, higher concentrations of ground-level ozone are associated with hotter days in the northeast, which can exacerbate heat-related health impacts, particularly for older adults, children, and those with asthma or other respiratory conditions. Wildfire smoke during hot, dry periods is also becoming more common in Vermont, resulting in similar respiratory impacts.

Further, increases in the incidence of vector-borne diseases (e.g. Lyme, West Nile and Eastern equine encephalitis) in Vermont and New England at-large have been observed and are partially attributed to warming conditions. The increase in average annual temperatures and shortened winters have allowed mosquitos and ticks to become more active earlier in the spring and remain active later in the fall. Because the incidence of Lyme disease in Vermont is higher than the national average at present, lengthening vector seasons is of great concern to community health in Vermont. Unhoused people or people working in the outdoors – loggers and farmers, for example – are most vulnerable to vector-borne illness (see: Infectious Disease).

Finally, hot weather can increase thermal stratification in water bodies, where shallow water layers are much warmer and do not readily mix with cooler, deeper water layers. Stratified water layers are most common in late summer and early fall, providing more favorable conditions for development of cyanobacteria blooms in Vermont’s lakes and ponds. Some types of cyanobacteria can release natural toxins or poisons (called cyanotoxins) into the water, especially when they die and break down. Swimming or wading in water with cyanobacteria may cause minor skin rashes, sore throats, diarrhea, stomach problems, or occasionally more serious health problems. Children and pets are at higher risk of exposure because they are more likely to play near the shoreline and drink water while swimming[[16]](#footnote-17).

The rise in average annual temperature and increased occurrence of prolonged hot weather events will also have impacts on infrastructure, the environment and the economy in Vermont. These impacts are also not exclusive to the extreme heat hazard, but rather will affect many other hazards addressed within this Plan.

Those who live in urbanized parts of Vermont will experience higher temperatures on hot sunny days than those who live more rurally. The Urban Heat Island Effect describes the higher temperatures due to the large concentrations of impervious surfaces, whose properties allow higher rates of heat retention than natural surfaces[[17]](#footnote-18). Thus, during an extreme heat event, urban areas may record higher temperatures, and may require more water and cooling resources than rural areas of Vermont. When considering heat events that have caused fatalities in Vermont history, they are occurring more frequently within residences in urban areas such as Chittenden County and even Waterbury. These incidents illustrate the dangers of the Urban Heat Island Effect, and the dangers behind residences ill-equipped for extreme heat.

**Built Environment**

Buildings are much more likely to use cooling systems in homes and buildings during a heat event. Most cooling systems rely on electricity. In the event of power loss resulting from a concurrent storm or from electrical grids overloading, health and safety for a large population could be severely compromised. This is a particular concern for congregate care facilities, shelters, or private residences that house people at especially high risk for experiencing a heat illness. Traditionally Vermont buildings were constructed primarily with winter heating in mind. There is little data on air conditioning in Vermont, but data from similar climate zones in the US suggest that at least half of Vermont homes do not have any form of air conditioning, and most that do have air conditioning only have window units in certain rooms. Improving building weatherization, installing cooling systems, and installing backup power systems are important adaptations to consider in our warming climate, which may be a lengthy, expensive, and cost prohibitive process for many.

Extreme heat can also result in damage to built infrastructure. Materials used in transportation infrastructure have a limited range of tolerance to heat, and the stress is exacerbated by the length of time temperatures are elevated and by stress factors, such as vehicle loadings on roadways and bridges during periods of congestion. Extreme heat causes thermal expansion of the concrete and steel and swelling of connections of bridges which can result in collapse. Many places combat this by spraying water on the bridges to cool them down; a potential problem in drought conditions. Paved surfaces, such as roads and runways, are typically made of asphalt or concrete, materials that can be affected, in some cases dramatically and quickly, by heat. Asphalt is a temperature-sensitive material, so when it gets hot, it gets soft, and when it cools it cracks; both factors that can reduce its life span. Concrete pavement can experience buckling if there isn’t room for the slabs to expand. It is also common for high temperatures to cause multiple problems for railway infrastructure. These problems include track buckling, sagging of overhead lines, bending of the rails, and expansion and then extreme compression as the rails cool, etc. When the lines become impassable, repairs must wait until the temperature drops and the rails are cool enough[[18]](#footnote-19). During the Pacific Heat Dome of 2021, damage was reported to roadways, rail and streetcar lines, and power cables. Repairs were delayed because it was too hot to work safely outdoors.

Higher temperatures cause increased rates of evapotranspiration, which can have significant impacts on water resources, especially shallow private wells (see: Drought).

**Natural Environment**

Native forests and ecosystems are projected to experience negative impacts of warming trends as well[[19]](#footnote-20). Higher temperatures will lead to increased evapotranspiration, soil drying rate and the frequency of short-term droughts, limiting water availability for tree growth (see: Drought). With 76% of the Vermont landscape covered by forest, and more than 50 tree species, increases in average annual temperatures will force these species to adapt or face local extinction. Northern hardwood species like maple, yellow birch and American beech are anticipated to be nearly eliminated in the State, replaced by those tree species that thrive in warmer, drier conditions, like oak and pine.

Related to extreme heat, a gradually warming climate interferes with ecosystem balance, leading to cascading effects in the natural environment. Changes are beginning to occur in species and populations as well as timing of reproductive cycles and food availability. [[20]](#footnote-21),[[21]](#footnote-22) For some species their ranges will expand further north, other species will adapt to conditions of where they are, while others will go extinct. Some insect species will benefit from greater winter survival and additional reproductive cycles in the longer growing season allowing them to adapt more quickly. Already stressed trees experiencing lower water availability and weakened defense mechanisms will be more vulnerable to pest invasion and disease (see: Invasive Species). Other insect species will face challenges finding food as they emerge to spring vegetation that arrived early and is too mature to consume. This in turn will impact the species higher on the food chain.

With a changing forest composition and greater levels of evapotranspiration, extreme heat and prolonged hot weather could also lead to an increase in the occurrence of wildfires in Vermont (see: Wildfire).

According to a recently published article[[22]](#footnote-23), the New England has been experiencing a faster warming rate than the rest of the United States. Burlington specifically has had warmer winters in the last 50 years than any other city in the country. Warming winters become concerning for the state’s vegetation, as the freeze-thaw cycles are threatened. Vegetation with shallow root systems, such as the sugar maple, rely on heavy snowpack to survive through the winter. These trees rely on the snow to protect the soil from freezing, as freezing soil can destroy root systems[[23]](#footnote-24). Damaged root systems can severely impact tree health and the surrounding environment. If the amount of snow keeps declining, it is predicted that sugar maples would grow 40% slower due to freezing roots, which could kill or severely impact the trees. Diminishing tree health would in turn lead to a decline in the amount of carbon sequestered from the atmosphere. If more carbon remains in the atmosphere, the greenhouse gas effect and thus impacts from climate change are intensified[[24]](#footnote-25).

**Economy**

In addition to the negative impacts towards tree health and the surrounding environment, the economy could suffer from declining maple syrup production. Vermont produces more maple syrup than any other state, generating almost half of the entire country’s supply[[25]](#footnote-26). If there continues to be a decline in snowpack in Vermont, the supply of maple syrup across the state and country could diminish, and many people could be out of jobs.

In Vermont, impacts to agriculture in general due to extreme heat and trends towards warming temperatures is a major economic concern. Crops could drop by nearly 40% in some areas, causing great disruptions on the agricultural sector in Vermont. The Vermont Agency of Natural Resource’s Climate Change Adaptation White Paper Series’ Agricultural White Paper[[26]](#footnote-27) identifies cold-weather crops, such as field corn, wheat and oats to be the most vulnerable to rising temperatures. The paper continues to note that many fruits grown in Vermont (e.g., blueberries and apples) require approximately 1,000 hours below 45°F to produce profitable yields, and with current climate projections, southern Vermont may not be able to meet these requirements. Maple sugaring, a $200 million industry in Vermont, will need to adapt to changing temperature patterns and adjust tapping schedules, as new estimates suggest that spring is arriving two weeks ahead of the average winter-spring transition.

Vermont’s dairy industry is responsible for 70-80% of the State’s annual agricultural sales. Dairy farmers across the State will need to pay attention to increasing temperatures, as cows can experience heat stress at as low as 75°F, especially on humid days, which can reduce milk production by up to 20%.

Issues with insect population changes discussed above will also affect crop yields and farm businesses[[27]](#footnote-28).

Extreme Heat Current Capabilities and Mitigation

As mentioned throughout the Extreme Heat hazard profile above, increases in annual average temperatures will have wide-reaching impacts to other hazards addressed in this Plan. Accordingly, many of the mitigation strategies and actions addressing the hazard impacts of Drought, Invasive Species, Wildfire and Infectious Disease can be both directly and indirectly tied to Extreme Heat (see: Mitigation Strategy).

The Vermont Urban & Community Forestry Program has partnered with the Arbor Day Foundation since 2017 to offer the Community Canopy (formerly Energy-Saving Trees) Program to residents of urban communities in Vermont[[28]](#footnote-29). Communities are selected in-part based on their relatively high risk for heat illnesses, according to the Vermont Heat Vulnerability Index, where one of their key risk factors was a lack of tree cover. Guidance is provided to participants to plant trees in locations to maximize summer shade or winter windbreak. Nearly 3,000 trees have been provided to Vermont residents through this program as of 2022. The development of Best Management Practices (BMPs) for tree planting in urban areas and naturalizing vegetation considering heat impacts and invasive species.

The risks posed to Vermont’s urban centers is exacerbated by the effects of Urban Heat Island effect. Therefore, this plan proposes actions outlining an assessment of heat risks in urban areas and its impacts on historically disadvantaged populations where, using that assessment to identify proper strategies for mitigating impacts. This plan supports the implementation of UHI mitigation strategies including the active use of urban forestry, green roofs, green infrastructure, and other vegetative strategies. Increasing the usage of highly reflective or high emittance materials for pavement, roofing, and construction can work to increase the albedo of urban spaces.

Other strategies that are being implemented or have been identified to address health risks of hot weather include:

* Updating the Vermont Heat Vulnerability Index to enhance risk factor data and better integrate adaptive capacity;
* Outreach, awareness raising, and capacity building among the public, health and emergency service professionals, and home visiting staff and volunteers;
* Improved systems for providing wellness checks for high-risk individuals at home and providing cooling, hydration, transportation, and medical assistance as needed;
* Assessing cooling capabilities at critical residential care facilities (e.g., long-term care, mental/behavioral health, homeless shelters), municipal and state government buildings, and competing a survey to assess home cooling capabilities;
* Building assessments and retrofits to help weatherize homes and congregate residential facilities housing high-risk individuals, install cooling equipment, improve ventilation, and install backup power;
* Designation of community daytime cooling centers and overnight cooling shelters, which may require building improvements in many communities;
* Enhanced support for unhoused Vermonters, including improved access to indoor cooling, storage, and hygiene facilities, secure outdoor shaded shelter, and material resource support for sun protection, hydration, and personal cooling;
* Adoption of workplace, school, and community policies to cancel or modify activities on hot days; and
* Development of State and local hot weather emergency communications and response plans. The Vermont Department of Health provides [extreme heat planning guidance and a planning template for local communities on their website](https://www.healthvermont.gov/environment/climate/hot-weather#prepare);
* Support expansion of Citizens Assistance Registry for Emergencies (CARE) to better identify households needing extra assistance during hazardous events (including extreme heat) and ensure mechanisms are in place to provide assistance as needed;
* Development of a State Heat Preparedness Plan and supporting the local adoption of heat plans into Local Emergency Management Plans (LEMPs) and mitigation strategies into Local Emergency Management Hazard Mitigation Plans (LHMPs).

The primary entity in Vermont devoted to extreme heat and prolonged hot weather mitigation and preparedness is the Vermont Department of Health Climate & Health Program[[29]](#footnote-30). The Climate & Health Program maintains a [Heat Safety webpage](https://www.healthvermont.gov/environment/climate/hot-weather) containing heat safety tips in 12 languages, a statewide cooling sites map, outreach support resources, and reports and resources that can be used for understanding heat risks and developing hot weather emergency response and long-term adaptation plans￼.

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