



HEAT EMERGENCY PLAN

Town of Gardiner

Abstract

The Town of Gardiner Heat Emergency Plan is a multiagency and locally coordinated plan that describes and organizes activities that result in efficient response to heat events.

Planning for extreme heat is critical for ensuring both the long-term resilience of a community as well as for reducing the number of deaths and hospitalizations that take place during high-heat events.

Town of Gardiner Heat Emergency Plan, December 2024

Author:

Anna Harrod-McGrew, Cornell Cooperative Extension Ulster County (CCEUC)
Gillian Mathews, Cornell Cooperative Extension of Ulster County (CCEUC)

Project Staff:

Melinda Herzog, Cornell Cooperative Extension of Ulster County (CCEUC)

Stakeholders:

Mary Beth Majestic, Gardiner Town Supervisor

Stephen Weir, Town of Gardiner, CSC Task Force

Brian Stiscia, Town of Gardiner Highway Superintendent

Nicole Lane, Gardiner Public Library

Michael J Madison, Deputy Director Ulster County Department of Emergency Services

Susan Koppenhaver, Director, Ulster County Office of the Aging

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**Hudson River
Estuary Program**



NEW YORK STATE WATER
RESOURCES INSTITUTE
Cornell University

**Cornell
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Definitions and Acronyms

(NYS Extreme Heat Action Plan, 2024)

Extreme heat event refers to various conditions of extreme heat that pose risks, including heat waves, heat domes, heat spells, and individual days of extremely high temperatures (NYS Extreme Heat Action Plan, 2024). The Ulster County Multijurisdictional Hazard Mitigation Plan defines extreme heat as individual days with maximum temperatures at or above 90° F or at or above 95° F. Heat waves are defined as three consecutive days with maximum temperatures above 90° F (Ulster County Multi-jurisdictional Hazard Mitigation Plan, 2024).

Heat advisories are issued at the county level when the heat index is predicted to remain above 95°F for two hours (upstate New York) or between 95 and 99°F for two consecutive days or between 100 and 104°F for any duration (NYC). A heat advisory means that people can be affected by heat if precautions are not taken. The issuance of a heat advisory is important to raise public awareness that individuals should take precautions. Heat advisories are also used to trigger other actions and regulations based on existing local or State plans and policies. *Heat advisories, warnings, and watches are issued by the National Weather Service (NWS).*

Excessive heat warnings are issued at the county level when the heat index is at or above 105°F for two hours or more at any location within the affected county or counties. A heat warning means that some people can be seriously affected by heat if precautions are not taken. Mortality begins to increase as the heat increases or stays above a heat index of 104°F. *Heat advisories, warnings, and watches are issued by the NWS.*

Excessive heat watches are issued one to two days in advance of when the probability that the excessive heat warning criteria will be met is 50–79%. *Heat advisories, warnings, and watches are issued by the NWS.*

Heat index is a measure indicating the level of discomfort the average person is thought to experience because of the combined effects of temperature and humidity.

Heat Vulnerability Index shows neighborhoods whose residents are more at risk for dying during and immediately following extreme heat

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Introduction & Purpose

As the Town of Gardiner addresses the escalating challenges posed by extreme heat events, the development and implementation of a comprehensive heat emergency plan becomes essential for community resilience and public safety. A heat emergency plan represents a carefully coordinated strategy, developed in collaboration with various stakeholders and government agencies, to address the diverse risks associated with prolonged heat waves. Central to this plan are proactive measures aimed at protecting all residents including vulnerable populations, such as the elderly and individuals with underlying health conditions, through the establishment of cooling centers, effective communication strategies and outreach, and coordinating with emergency management offices to set activation thresholds based on weather forecasts.

The plan involves periodic reviews and updates to adapt to changing climate conditions and community needs. This iterative process ensures that the plan effectively addresses current and future heat-related challenges. Through stakeholder engagement and cross-departmental coordination, the town can enhance resilience to heat waves and minimize adverse impacts on public health and infrastructure. Through planning, regular review, and a commitment to inclusivity and adaptability, the Town of Gardiner aims to enhance its capacity to mitigate the adverse effects of rising temperatures, thereby fostering a safer and more resilient community for all residents.

What is Extreme Heat?

Extreme heat refers to weather conditions characterized by unusually high temperatures over an extended period, typically accompanied by elevated humidity levels. More specifically, extreme heat events occur over the span of 2 to 3 days with temperatures above 90 degrees and accompanying high humidity levels.¹ Extreme heat events are defined by surpassing certain thresholds relative to the local climate and as a result that definition varies by region throughout New York State. These events can vary in intensity and duration but often manifest as heat waves, which are prolonged periods of abnormally hot weather relative to the seasonal average. Extreme heat is a significant public health concern as it can lead to various adverse impacts on human health, infrastructure, and ecosystems. Ulster County defines extreme heat as individual days with maximum temperatures at or above 90° F or at or above 95° F. Heat waves are defined as three consecutive days with maximum temperatures above 90° F (Ulster County Multi-jurisdictional Hazard Mitigation Plan, 2024).²

At its core, extreme heat poses a significant risk to human health due to its potential to cause heat-related illnesses, such as heat exhaustion, heat stroke, and dehydration. Vulnerable populations, including the elderly, children, pregnant women, and individuals with pre-existing health conditions, are particularly susceptible to these health risks. During heat waves, the body's ability to regulate temperature can be overwhelmed, leading to a cascade of physiological responses that can result in heat-related illnesses or even death if left untreated.

¹ New York State. 2024. Extreme Heat Action Plan. Adaptation Agenda for 2024–2030.

<https://dec.ny.gov/environmental-protection/climate-change/effects-impacts/extreme-heat>

² Ulster County Department of Emergency Services, 2024, Ulster County Multi-Jurisdictional Hazard Mitigation Plan

Furthermore, extreme heat can strain critical infrastructure systems, including power grids, transportation networks, and water supply systems. High temperatures can lead to increased energy demand for cooling purposes, potentially causing power outages or overloading electrical grids. Ecosystems are also vulnerable to the impacts of extreme heat, with prolonged high temperatures contributing to drought conditions, wildfires, and stress on plant and animal populations. Extreme heat events pose significant challenges to public health, infrastructure resilience, and ecosystem stability, underscoring the importance of proactive measures, such as heat emergency planning, to mitigate their impacts and protect communities.

Impact of Climate Change on Extreme Heat

Climate change refers to the change in average climate conditions and the global atmosphere over a long period of time attributable to human activity. One aspect of climate change involves the trapping of carbon dioxide and nitrogen in the atmosphere, gases that are produced when burning fossil fuels. Once in the atmosphere, these gases let in sunlight but do not let out heat. This extra heat trapped in earth’s atmosphere leads to warmer temperatures on earth, and, more frequently, extremely high temperatures. Key findings in the New York State Climate Impacts Report included average and maximum temperatures having increased since the early 1900s with projections showing a continued upward trend. The state was found to be warming at a higher rate than the national average with heat waves expected to occur on a more regular basis³. These projections indicate annual average temperatures will increase across the state throughout the 21st century (Figure 1).

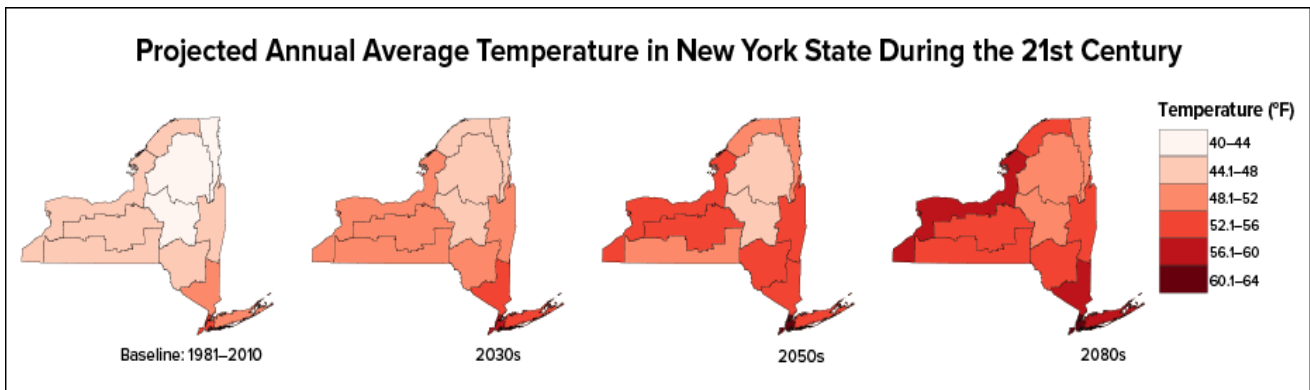


Figure 1. Projected changes to annual average temperatures over the course of the century. Refer to Chapter 2, *New York State’s Changing Climate*, NYS Climate Impacts Assessment

³ Lamie, C., Bader, D., Graziano, K., Horton, R. John, K., O’Hern, N., & Spungin, S. (2024). *Chapter 2: New York State’s changing climate*. In New York State Climate Impacts Assessment [Interim version for public release]. <https://nysclimateimpacts.org/wp-content/uploads/2024/01/Assessment-ch2-NYS-changing-climate-01-09-24.pdf>

Historic Mortality and Morbidity Rates in Relation to Extreme Heat

According to the National Weather Service, exposure to extreme heat has become the leading weather-related cause of death in the United States⁴. According to the National Weather Service 555 deaths were attributed to heat in 2023 in the United States (Figure 3). This number is significantly higher than those of other weather events.

Deaths due to heat exposure have risen sharply in the past few years as average temperatures increase. When heat as a contributing factor is considered in the cause of death (Figure 2), fatalities nearly double in some years according to the CDC⁵.

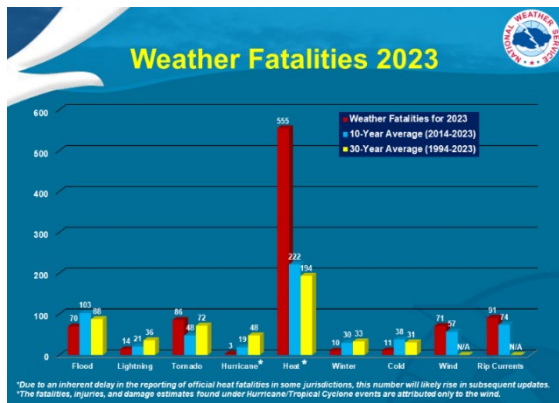


Figure 3. Weather Fatalities in 2023 according to the National Weather Service. Weather Fatalities 2023”, Weather Related Fatality and Injury Statistics.

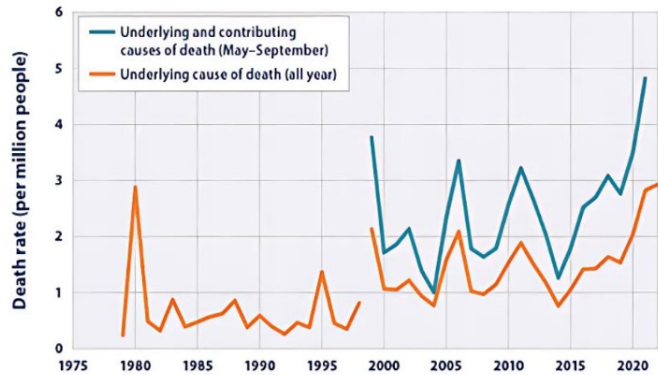


Figure 2. Heat Related Mortality data 1975 to present according to the CDC. CDC (U.S. Centers for Disease Control and Prevention). (2024).

The Town of Gardiner

The Town of Gardiner, located in the Hudson Valley in the region of New York State, in the southern part of Ulster County. It is bordered by the Town of Rochester and New Paltz to the North, The Towns Ellenville and Wawarsing to the West, the Town of Plattekill to the East, and the Town of Shawangunk to the South. The Town is defined by its proximity to the Shawangunk Ridge, identified by the Nature Conservancy as “one of Earth’s last great places.”

“As detailed in the Town of Gardiner Open Space Plan, adopted in 2007, the Town is rural and dominated by farms, rural residential properties on larger parcels, concentrated mixed use hamlet development notably in the central hamlet of Gardiner, and some limited suburban style residential subdivisions. An estimated 4600 acres or 16% of Town land is in rural residential use, while some 3600 acres or 13% of the land is vacant. The west 1/3 of the Town is on or borders the Shawangunk Ridge where state park and other preserved open space dominates with occasionally large lot rural residences off limited public road access. About one-fifth of the Town’s 28,600 acres has been and remains in active agriculture, and that activity is rising.” (Town of Gardiner Comprehensive Plan)

⁴ Weather Fatalities 2023”, Weather Related Fatality and Injury Statistics. National Weather Service.

<https://www.weather.gov/hazstat/>

⁵ CDC (U.S. Centers for Disease Control and Prevention). (2024). *Indicator: Heat-related mortality* (Annual national totals provided by National Center for Environmental Health staff in June 2024). National Center for Health Statistics. <https://ephtracking.cdc.gov/>

Heat Vulnerability Index and Vulnerable Populations in Gardiner

Vulnerable populations are identified by the following criteria:

1. Their physical condition makes them less able to handle heat stress which will include persons with chronic illness and who are over/underweight.
2. They are not able to easily control their environment, which will include dependent persons, urban dwellers, and those who are of low income.
3. They are more difficult to reach through ordinary communication channels (live alone, homeless, non-English speaking, illiterate, culturally/socially isolated.)

Other risk factors that may be associated with people being at risk of heat-related illnesses include:

1. No air conditioning in the home and/or no time spent in air conditioning outside the home.
2. Failure to reduce activity and/or increase fluid intake during periods of high heat.
3. Use of medicines and/or alcohol.
4. Living on the second or third floor of a non-air-conditioned building.

The Heat Vulnerability Index (HVI), developed by the New York State Department of Health, assists municipalities around the state in identifying the vulnerability of their populations to extreme heat events. Thirteen environmental and socio-demographic factors were identified as heat vulnerability factors from previous heat-health studies and grouped into four categories: 1. Language vulnerability; 2. Socio-economic vulnerability; 3. Environmental and urban vulnerability; 4. Elderly isolation and elderly vulnerability. Census tract data for these factors was obtained from the U.S. Census Bureau and the National Land Cover Database to determine heat vulnerability in each NYS census tract⁶. In combining these factors Gardiner scores fairly low in the Heat Vulnerability index (Figure 4). The two areas where Gardiner is most susceptible are in elder isolation/elderly vulnerability and in language vulnerability (Figures 5 & 6). While still low, Gardiner begins to approach the midpoint in both these areas.

⁶ Nayak et al. (2018). Development of a heat vulnerability index for New York State. *Public Health*, 129(1), 1-10. [DOI: 10.1016/j.puhe.2017.09.006]

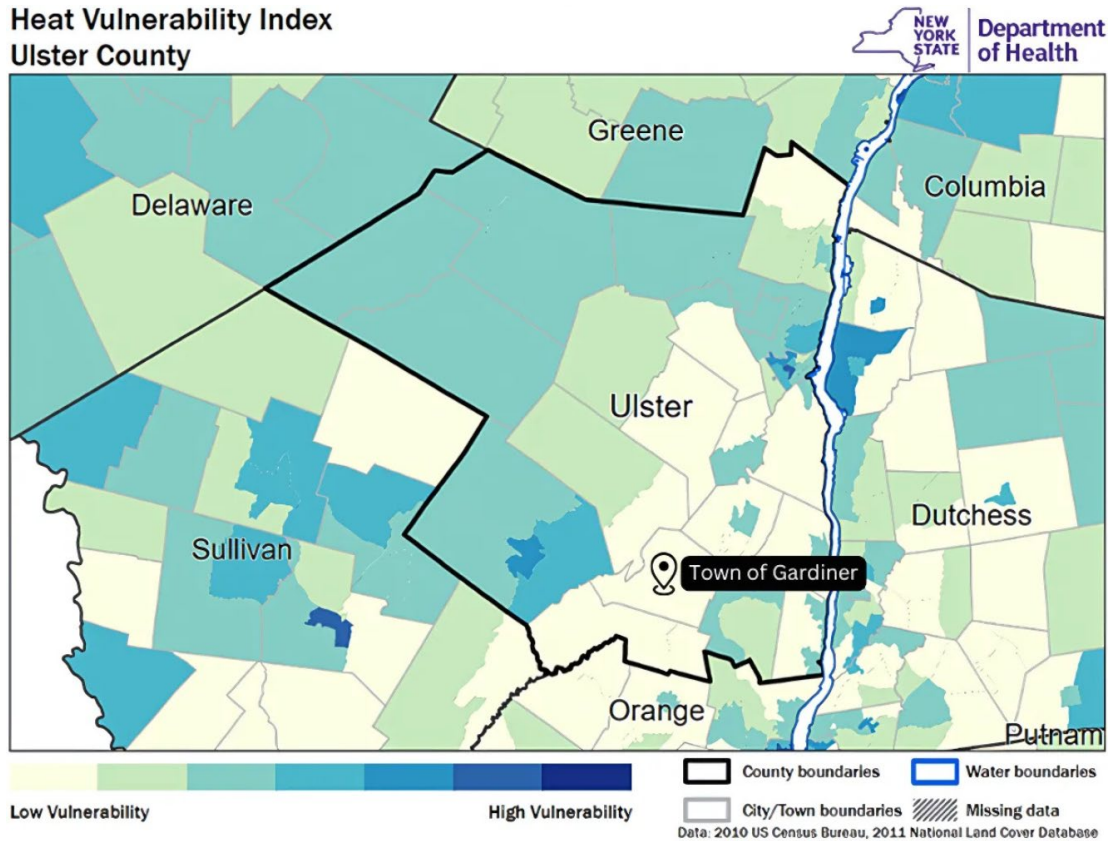


Figure 4. Heat Vulnerability Index for Gardiner, NY. Nayak et al. (2018). Development of a heat vulnerability index for New York State. *Public Health*, 129(1), 1-10. [DOI: 10.1016/j.puhe.2017.09.006]

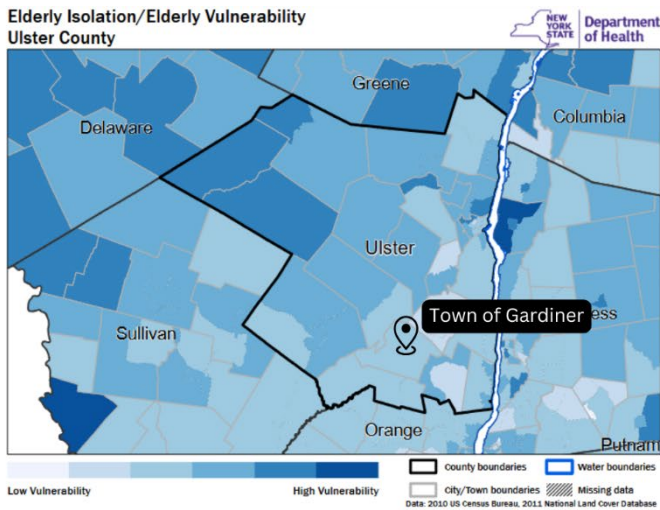


Figure 5. Elderly Vulnerability in Ulster County. Nayak et al. (2018). Development of a heat vulnerability index for New York State. *Public Health*, 129(1), 1-10. [DOI: 10.1016/j.puhe.2017.09.006]

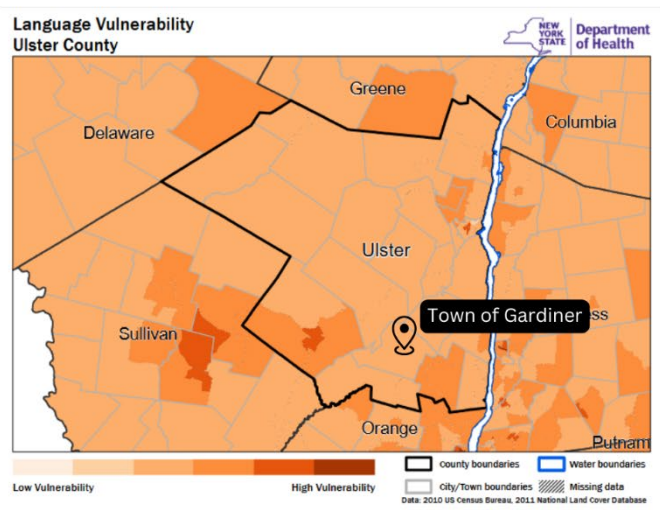


Figure 6. Language Vulnerability in Ulster County. Nayak et al. (2018). Development of a heat vulnerability index for New York State. *Public Health*, 129(1), 1-10. [DOI: 10.1016/j.puhe.2017.09.006]

Gardiner Heat Action Plan

The Town Supervisor will assume the role of coordinator for the heat plan. The Deputy Town Supervisor will coordinate in the event of the Supervisor’s absence.

The coordinator will be responsible for:

- Coordination and overseeing the updating of the Heat Emergency Plan.
- Assure that responses during a heat crisis are carried out and that the needs of “at risk” residents are addressed.
- Provide heat intervention updates to residents.
- Act as the emergency management liaison when requested during an excessive heat crisis.

Part 1. During the Heat Season

The heat season will be defined by the period of time in which temperatures are typically highest in the Town. For Gardiner that will be between the months of May and September. Average high and low temperatures according to NOAA are listed in Table 1⁷.

Average Monthly Maximum and Minimum Air Temperatures for Gardiner (°F), 2006-2020

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| Max | 35.6 | 37.6 | 47.1 | 60.2 | 71 | 78.7 | 84.2 | 81.5 | 74.9 | 63.1 | 50.9 | 40.1 |
| Min | 18.5 | 19.1 | 27.2 | 37 | 47.6 | 56.2 | 61.9 | 59.5 | 52.2 | 41.8 | 30.9 | 24.4 |

Figure 7. Average Monthly Maximum and Minimum Air Temperatures for Gardiner, NY according to NOAA. Note: Heat Season is outlined in blue. U.S. Climate Normals Quick Access, National Centers for Environmental Information, NOAA.

During the heat season the town will make efforts to complete the following actions:

Promote Community Events Taking Place in Air Conditioned Spaces or Shaded Outdoor Spaces

The town will make efforts to track community events taking place in air conditioned or outdoor shaded areas and work to promote them to the public. When possible the town will share events to the town website and social media platforms. Examples of promoted events could be programs at the local library or operating hours of the Ulster County Pool.

Direct Residents to the [Town of Gardiner Disaster Preparedness Page with Information on Extreme Heat](#)

In 2023 the Town of Gardiner worked with CCE Ulster to create a Disaster & Emergency Preparedness page on the town website. This page hosts useful information for residents during a heat event.

⁷ U.S. Climate Normals Quick Access, National Centers for Environmental Information, NOAA, <https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-monthly&timeframe=15&station=USW00004789>

Utilize social media platforms to educate residents about extreme heat

The town worked with CCE Ulster in 2023 to develop social media posts educating residents about weather related disasters, including extreme heat. The town also has access to the [Tool Kit](#) created as a part of that project containing a range of heat related educational posts and infographics.

Part 2. During an Extreme Heat Event

Gardiner will activate Part 2 of this Heat Action Plan when extreme heat is forecasted to occur and the County has declared a heat emergency. The specific criteria for implementing these actions are based on thresholds established by the Ulster County Department of Emergency Services and the National Weather Service. Heat-related preparation and response activities will be carried out in consultation and coordination with local agencies.

During an extreme heat event the town will make efforts to complete the following actions:

Cooling Stations will be notified and activated

The Town will share information about location and open hours of established cooling stations through the town website, social media platforms, and e-mail notifications.

- Established Cooling Stations in the Town of Gardiner:
 - [Gardiner Town Hall \(during operating hours\)](#)
[2340 US-44](#)
[Gardiner, NY 12525](#)
 - [Gardiner Public Library \(during operating hours\)](#)
[133 Farmer's Turnpike](#)
[Gardiner, NY 12525](#)

Develop and Activate a Neighbor to Neighbor Program

As noted earlier in this plan, vulnerable populations are at greater risk during heat events. The town will work to develop a neighbor to neighbor check-in program by collecting phone numbers and e-mails of residents who may be at risk. The town will advertise the sign-up process for this list and encourage at-risk residents to opt in. This program will be piloted upon approval of this plan and improved during subsequent updates to the Heat Emergency Plan.

Coordination with Utility Companies

During power outages the Town is in regular communication with Central Hudson. The town hosts information about steps to take during power outages on the [Gardiner disaster preparedness page](#).

Examples and Resources:

- [How to Check in on Neighbors During a Heat Wave](#), New York City
- [Help Someone Stay Cool During Extreme Heat](#), American Association of Retired Person

Plan Monitoring & Revision

To maximize impact, the Town of Gardiner will need to monitor, evaluate, and maintain this plan with scheduled formal review taking place at least every 5 years. Responsibilities for monitoring, evaluating, and implementing actions identified within the plan should be designated by the municipality. The Town of Gardiner should consider using existing local municipal groups such as, but not limited to, the CAC or CSC task force. Communities should take advantage of local expertise and knowledge whenever possible and capitalize on resources and technical support available through local and regional partnerships with Cornell Cooperative Extension and other local agencies.

Future Opportunities to Prepare Residents for Heat Emergencies

Pursue the following actions under the NYS Climate Smart Communities Program:

[PE6 Action: Green Parking Lot Policies](#)

Green Parking Lot policies reduce environmental impacts of parking areas by reducing coverage of impervious surfaces and utilizing alternative and permeable materials. These policies can also allow for increased planting and shade coverage reducing the heat island effect that can often occur in paved lots.

[PE6 Action: Local Forestry Program](#)

By following the guidance of the Local Forestry Action the town will have the capacity to preserve the existing tree canopy therefore, again, preserving shade structures that are of great assistance during heat events. Going further, the town can enact a tree preservation ordinance (see [Village of New Paltz](#) as an example) enabling the town to better maintain existing tree cover. The town has actively participated in the Trees for Tribes program which would also qualify for points under this action.

Educational Materials to be Distributed During Heat Emergencies

Examples and Resources:

- [How to Check in on Neighbors During a Heat Wave](#), New York City
- [Help Someone Stay Cool During Extreme Heat](#), American Association of Retired Person
- Extreme Heat infographics: https://www.weather.gov/wrn/heat_infographics

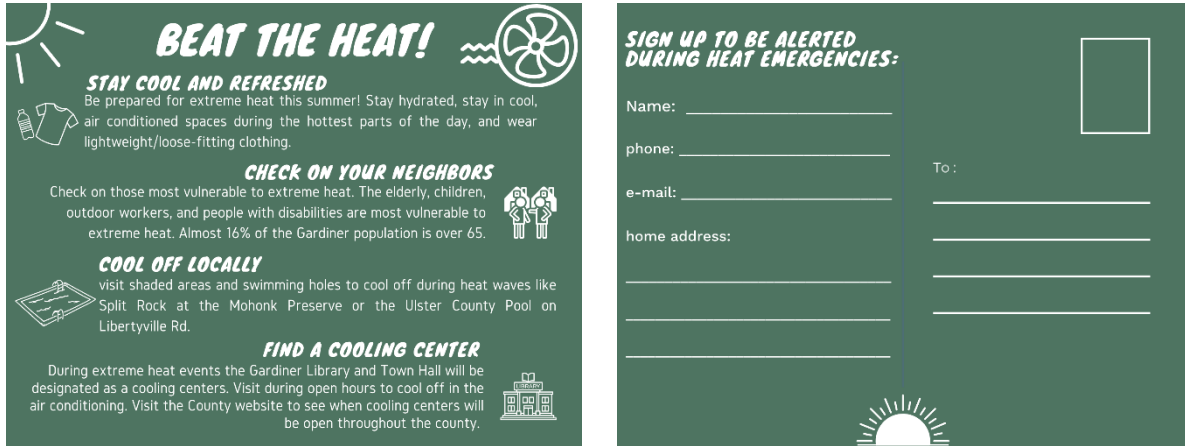


Figure 8. sample postcard for the Town of Gardiner to distribute to residents offering information on extreme heat events

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