5.4.3 Extreme Temperature

This section provides a profile and vulnerability assessment for the extreme temperature hazard in Chenango County.

5.4.3.1 Hazard Profile

This section provides profile information including description, extent, location, previous occurrences and losses, and the probability of future occurrences for the extreme temperatures hazard.

Description

Extreme temperature includes both cold and heat events that can have a significant impact to human health, commercial/agricultural businesses and primary and secondary effects on infrastructure such as failing pipes and power failure. E*xtreme cold* or *extreme heat* definitions can vary across the country based upon the temperature to which population is accustomed.

Extreme Cold

Extreme cold events occur when temperatures drop significantly below normal in an area for an extended period of time. No specific definition exists for Extreme Cold, temperatures at or below zero degrees for an extended period of time characterize a cold wave event in New York State (NYS DHSES 2019).

Extreme Heat

Extreme heat is defined as temperatures which hover 10 degrees or more above the average high temperature for a region and that last for several weeks (CDC 2016). An extended period of extreme heat of three or more consecutive days is typically called a heat wave and is often accompanied by high humidity (NWS 2013). Humid or muggy conditions occur when a *dome* of high atmospheric pressure traps hazy, damp air near the ground. Extreme heat days in New York State are defined 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 (NYSERDA 2014) Excessive heat is when the heat index reaches 105 °F for at least three hours on two consecutive days, and the nighttime air temperature does not drop below 75 °F (NYS DHSES 2019).

Extent

Extreme Cold

The extent (severity or magnitude) of extreme cold temperatures generally are measured through the Wind Chill Temperature (WCT) Index. The WCT Index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from wind chill. For details regarding the WCT Index, refer to: http://www.nws.noaa.gov/om/winter/windchill.shtml. The WCT Index is presented in Figure 5.4.3-1. The National Weather Service (NWS) provides alerts when Wind Chill indices approach hazardous levels. Table 5.4.3-1 explains these alerts.

Wind Chill At a Glance

The wind chill is how cold it actually feels on your skin when the wind is factored in. It may also be referred to as the "feels-like" temperature. Bitterly cold wind chills increase your risk of developing frostbite and hypothermia.

Source: The Weather Channel (2019)

Figure 5.4.3-1. NWS WCT Index

WIND CHILL CHART (Source: NWS)

Temperature (°F)

Wind (mph)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times

30 minutes | 10 minutes | 5 minutes

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V0.16) + 0.4275T(V0.16)

Source: NYS DHSES, 2019

Table 5.4.3-1. National Weather Service Alerts for Extreme Cold

Alert	Criteria
Wind Chill Advisory	NWS issues a wind chill advisory when seasonably cold wind chill values, but not extremely cold values are expected or occurring.
Wind Chill Watch	NWS issues a wind chill watch when dangerously cold wind chill values are possible.
Wind Chill Warning	NWS issues a wind chill warning when dangerously cold wind chill values are expected or occurring.

Source: NWS 2018

Additionally, the National Weather Service issues Freeze Watch, Warning, and Frost Advisories. The criteria for these alerts are described in the table below.

Table 5.4.3-2: National Weather Service Alerts for Freezing

Alert	Criteria
Hard Freeze Warning	NWS issues a hard freeze warning when temperatures are expected to drop below 28°F for an extended period of time, killing most types of commercial crops and residential plants.
Freeze Warning	When temperatures are forecasted to go below 32°F for a long period of time, NWS issues a freeze warning. This temperature threshold kills some types of commercial crops and residential plants.
Freeze Watch	NWS issues a freeze watch when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours. A freeze watch is issued in the autumn until the end of the growing season and in the spring at the start of the growing season.
Frost Advisory	A frost advisory means areas of frost are expected or occurring, posing a threat to sensitive vegetation.

Source: NYS DHSES, 2019

Extreme Heat

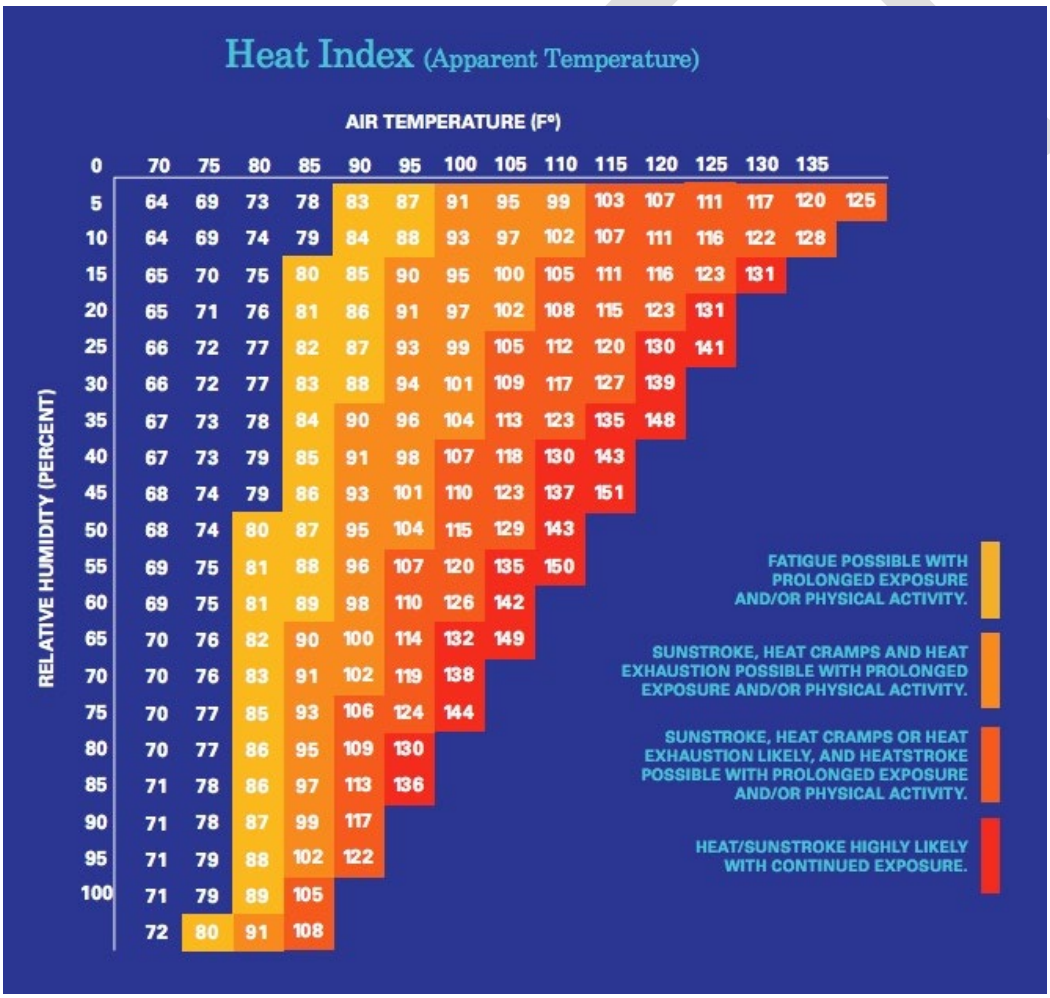
The extent of extreme heat temperatures generally is measured through the Heat Index, identified in Table 5.4.3-2. Created by the NWS, the Heat Index is a chart that measures apparent temperature of the air as it increases with the relative humidity. To determine the Heat Index, both the temperature and relative humidity are needed. Once both values are identified, the Heat Index is the corresponding number of both the values, as seen in Figure 5.4.3-2 This provides a measure of how temperatures feel. However, the values are devised for shady, light wind conditions. Exposure to full sun can increase the index by up to 15 degrees (NYS DHSES 2019).

Relative Humidity At a Glance

Relative humidity is the amount of moisture in the air at a certain temperature compared to what the air can "hold" at that temperature…it is measured as a percentage or ratio of the amount of water vapor in a volume of air RELATIVE to a given temperature and the amount it can hold at that given temperature. Warm air can hold more moisture than cold air.

Source: Molekule, 2020

Figure 5.4.3-2. Heat Index Chart



Source: NYS DHSES, 2019

The NWS provides alerts when Heat Indices approach hazardous levels. Table 5.4.3-2 explains these alerts.

Table 5.4.3-2. National Weather Service Alerts

Alert	Criteria
Heat Advisory	Criteria for a Heat Advisory in New York is a heat index of 95-104 °F. The heat index has to remain at or above criteria for a minimum of 2 hours. Heat advisories are issued by county when any location within that county is expected to reach criteria.
Excessive Heat Watch	Issued when Heat Warning criteria is possible (50-79%) 1 to 2 days in advance.
Excessive Heat Warning	Criteria for an Excessive Heat Warning is a heat index of 105 °F or greater that will last for 2 hours or more. Excessive Heat Warnings are issued by county when any location within that county is expected to reach criteria.

Source: NWS, 2020

Location

According to the New York State Hazard Mitigation Plan (2019), excessive heat can occur anywhere within New York State. Excessive heat incidents are widespread, even if there are localized cooler areas. The State itself has varied summers, with warmer conditions experienced in the south and more mild conditions experienced elsewhere in the State.

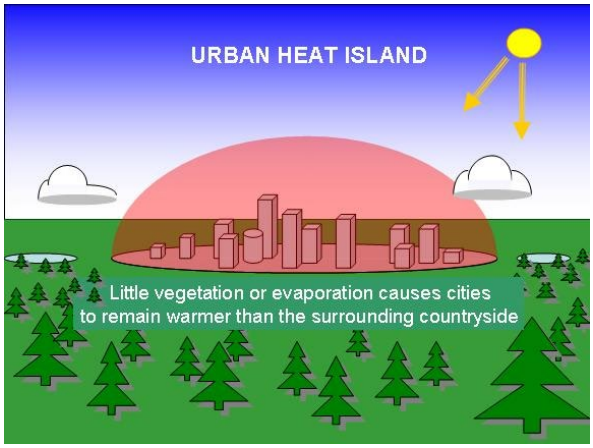
New York State is divided into 10 climate divisions: Western Plateau, Eastern Plateau, Northern Plateau, Coastal, Hudson Valley, Mohawk Valley, Champlain Valley, St. Lawrence Valley, Great Lakes, and central Lakes. According to NCDC, "Climatic divisions are regions within each state that have been determined to be reasonably climatically homogeneous" (CPC 2005). Chenango County is located within the Eastern Plateau Climate Division. Refer to https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/CLIM_DIVS/states_counties_climate-divisions.shtml for a figure showing the climate divisions in New York State.

Extreme Cold

Extreme cold temperatures occur throughout most of the winter season and generally accompany most winter storm events throughout the state. When atmospheric pressures are higher than normal and Arctic air masses enter the area, extreme cold temperatures impact Chenango County, flowing southward from central Canada or the Hudson Bay (NCDC 2006).

Extreme Heat Temperatures

Extreme heat temperatures of varying degrees occur throughout the county for most of the summer season, except for areas with high altitudes. Extreme heat temperatures result from high pressure systems off of the Atlantic Coast remaining in place for several days, causing persistent air flow from the south to bring heat into the area (NCDC 2006). Areas of denser urban development, such as the City of Norwich, are vulnerable to the urban heat island effect phenomenon, which can further raise temperatures.



Source: weatherquestions.com, 2019

Previous Occurrences and Losses

Extreme temperature events occur with some regularity in Chenango County. To identify the events in Chenango County, the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental

Information (NCEI) Storm Events database was queried. The database records and defines extreme temperature events as follows:

- Cold/Wind Chill is reported in the NOAA-NCEI database when a period of low temperatures or wind chill temperatures reach or exceed locally or regionally defined advisory conditions (typical value is negative 18 °F or colder).
- Excessive Heat is reported in the NOAA-NCEI database whenever heat index values meet or exceed locally or regionally established excessive heat warning thresholds.
- Extreme Cold/Wind Chill is reported in the NOAA-NCEI database when a period of extremely low temperatures or wind chill temperatures reaches or exceeds locally or regionally defined warning criteria (typical value around negative 35 °F or colder).
- Heat is reported in the NOAA-NCEI database whenever heat index values meet or exceed locally or regionally established advisory thresholds.

FEMA Disaster Declarations

Between 1954 and 2020, FEMA has not included New York State in any extreme temperature-related disaster declarations. However, Chenango County has been included in six winter storm-related declarations, as shown in Table 5.4.3-3. These are shown because cold temperatures are often associated with these disaster types.

Table 5.4.3-3 Winter Storm Related Disaster (DR) and Emergency (EM) Declarations 1954 – 2020

Disaster Number	Event Date	Declaration Date	Incident Type	Title
EM-3107	March 13 – March 17, 1993	March 17, 1993	Snow	Severe Blizzard
EM-3173	December 25 – January 4, 2002	February 25, 2003	Snow	Snowstorms
EM-3184	February 17 –18, 2003	March 27, 2003	Snow	Snow
DR-1467	April 3 – 5, 2003	May 12, 2003	Severe Ice Storm	Ice Storm
EM-3299	December 11 – 31, 2008	December 18, 2008	Severe Storm(s)	Severe Winter Storm
DR-4322	March 14 – 15, 2017	July 12, 2017	Snow	Severe Winter Storm and Snowstorms

Source:FEMA 2020
DR Major Disaster Declaration (FEMA)
EM Emergency Declaration (FEMA)
FEMA Federal Emergency Management Agency

USDA Disaster Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Chenango County was included in USDA declaration S4031, which occurred in September 2016 and entailed drought and heat/excessive heat.

Previous Events

Information regarding specific details of temperature extremes in Chenango County is scarce; therefore, previous occurrences and losses associated with extreme temperature events are limited. For this 2021 HMP update, no extreme temperature events reported to NOAA-NCEI between 2015 and 2020. For events occurring prior to 2015, refer to Appendix E (Supplementary Data). Table 5.4.3-4 presents the number of extreme temperature events that occurred between 1950 and 2020; however, the events summarized in the table below include events reported to NOAA-NCEI and does not include all events that occurred in Chenango County.

Table 5.4.3-4. Extreme Temperature Events, 1950 – 2020

Hazard Type	Number of Occurrences Between 1950 and 2020	Total Fatalities	Total Injuries	Total Property Damage ($)	Total Crop Damage ($)
Cold/Wind Chill	14	0	0	$20,000	$0
Excessive Heat	1	0	0	$0	$0
Extreme Cold/Wind Chill	2	0	0	$5,000	$0
Heat	3	0	0	$0	$0
TOTAL	**20**	**0**	**0**	**$25,000**	**$0**

Source:NOAA-NCEI 2020

Climate Change Projections

The frequency and duration of heat waves, defined as three or more consecutive days with maximum temperatures at or above 90 ˚F, is expected to increase (Table 5.4.3-5). In contrast, extreme cold events, defined both as the number of days per year with minimum temperature at or below 32 ˚F and those at or below 0 ˚F, are expected to decrease as average temperatures rise (NYSERDA 2011). With the increase in temperatures, heat waves will become more frequent and intense, increasing the number of heat-related illness and death and posing new challenges to the energy system, air quality and agriculture. Table 5.4.3-5 displays the projected changes in these events and includes the minimum, central range and maximum days per year.

Table 5.4.3-5. Changes in Extreme Events in Region 3 – Heat Waves and Drought Conditions

Event Type (2020s)	Low Estimate (10th Percentile)	Middle Range (25th to 75th Percentile)	High Estimate (90th Percentile)
Days over 90°F (8 days)	15	17 to 21	23
# of Heat Waves (0.7 heat waves)	2	2 to 3	3
Duration of Heat Waves (4 days)	4	4 to 5	5
Days below 32°F (133 days)	119	122 to 130	134

Source: NYSERDA 2014

Probability of Future Occurrences

Chenango County is anticipated to experience extreme temperatures annually that could coincide with or induce secondary hazards, such as snow, hail, ice or wind storms, thunderstorms, drought, human health impacts, and utility failures. Table 5.4.3-6 shows the annual number of events, recurrence interval, annual probability, and annual percent chance of occurrence for the hazards associated with extreme temperatures and reported in the NOAA-NCEI Storm Events Database.

Table 5.4.3-6. Probability of Occurrences of Extreme Temperature Events

Hazard Type	Number of Occurrences Between 1950 and 2020	% chance of occurrence in any given year
Cold/Wind Chill	14	20%
Extreme Cold/Wind Chill	2	3%
Heat	3	5%

Hazard Type	Number of Occurrences Between 1950 and 2020	% chance of occurrence in any given year
Excessive Heat	1	1%
TOTAL	**20**	**28%**

Source: NOAA NCEI 2020
Note:Probability was calculated using the available data provided in the NOAA-NCDC storm events database.

Based on historical records and input from the Steering Committee, the probability of occurrence for extreme temperatures in Chenango County is considered *frequent* (100% annual probability; a hazard event may occur multiple times per year).

5.4.3.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable. For the extreme temperature hazard, the entire county has been identified as exposed; therefore, all assets are potentially vulnerable. The following text estimated potential impacts of extreme temperatures on Chenango County.

Impact on Life, Health and Safety

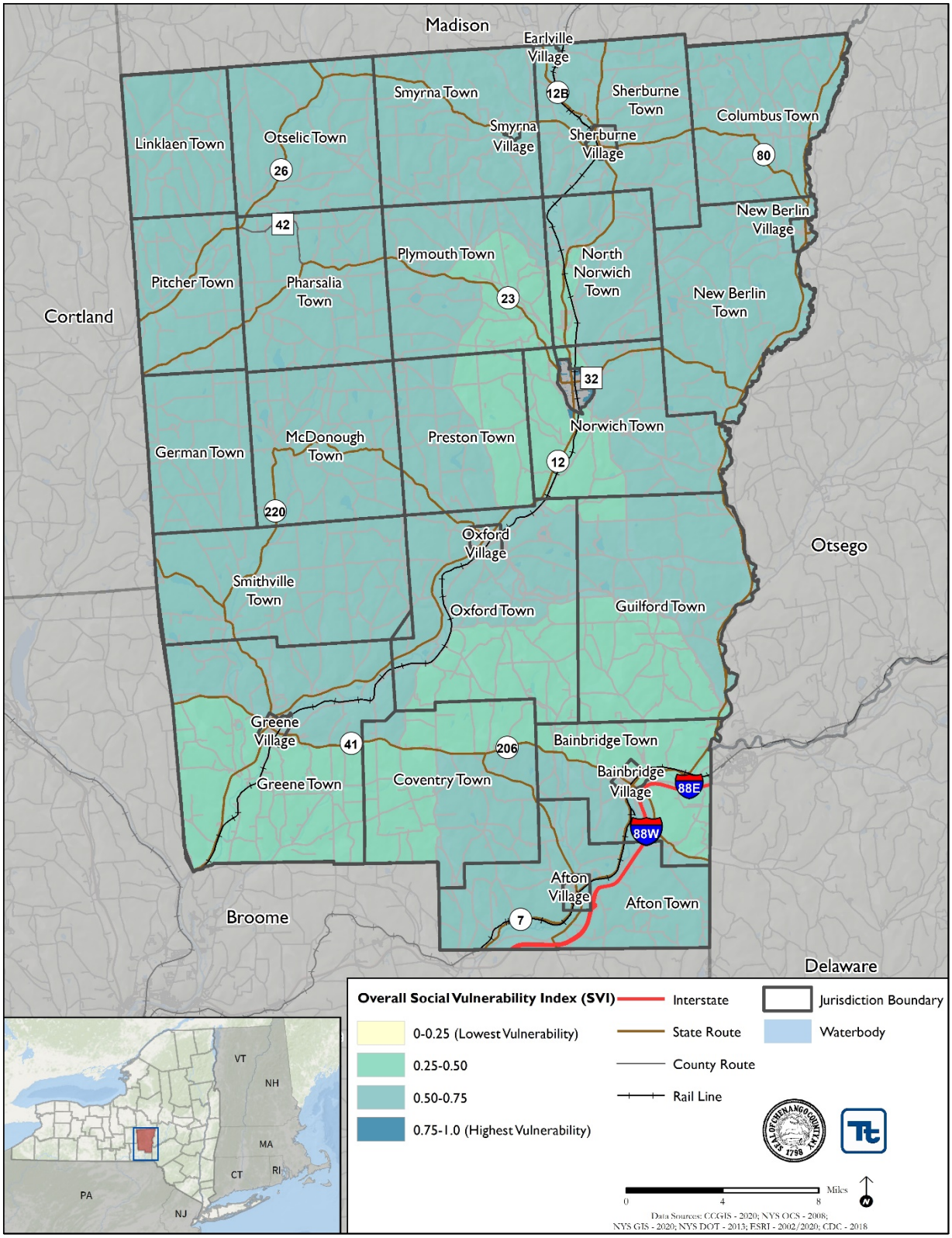
For the purposes of this HMP, the entire population of Chenango County is exposed to extreme temperature events (48,348) (U.S. Census 2018 ACS 5-Year Population Estimate). Extreme temperature events have potential health impacts including injury and death. According to the Centers for Disease Control and Prevention, populations most at risk to extreme cold and heat events include the following: 1) the elderly, who are less able to withstand temperatures extremes due to their age, health conditions, and limited mobility to access shelters; 2) infants and children up to four years of age; 3) individuals with chronic medical conditions (e.g., heart disease, high blood pressure), 4) low-income persons that cannot afford proper heating and cooling; and 5) the general public who may overexert during work or exercise during extreme heat events or experience hypothermia during extreme cold events (CDC 2020).

In Chenango County, the following areas have the highest percentage of elderly population: Village of New Berlin (26.6%), Town of Oxford (23.9%), Village of Greene (20%), Village of Afton (19.1%), and Town of McDonough (18.2%). Refer to Figure 4-5 in Section 4 (County Profile) that displays the densities of populations over 65 in Chenango County.

Residents with low incomes might not have access to housing or their housing can be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). In Chenango County, areas with the highest concentration of low-income populations are very similar to those with the highest concentrations of elderly populations; however, there is fewer high concentrations in the more rural areas of the county's towns. Refer to Figure 4-5 in Section 4 (County Profile) that displays the densities of low-income populations in Chenango County.

According to the Center for Disease Control and Prevention's (CDC) 2016 Social Vulnerability Index, areas within the City of Norwich are the most vulnerable within the County. The average social vulnerability score for Chenango County is 0.5304, indicating moderate to high level of vulnerability. Vulnerable populations throughout the county may be more susceptible to the impacts from extreme temperatures. Figure 5.4.3-4 below displays the CDC 2016 Social Vulnerability Index for Chenango County.

Figure 5.4.3-3. CDC's Social Vulnerability Index 2016



According to NOAA's 2008 *Winter Storms: The Deceptive Killers*, approximately 50 percent of the injuries related to extreme cold temperatures happen to people over 60 years old, more than 75 percent of those injured are male and about 20 percent occur in the home (NOAA 2008). The homeless and individuals who lack proper sheltering and heating are particularly vulnerable to extreme cold and wind chill.

Exposure to excessive heat can pose a number of health risks to individuals. Table 5.4.3-7 and Table 5.4.3-8 identify different health hazards related to extreme heat conditions.

Table 5.4.3-7. Health Effects of Extreme Cold

Health Hazard	Symptoms
Wind Chill	Wind chill is the feel of wind and cold on exposed skin. Body temperature decreases due to heat loss from wind.
Frostbite	Frostbite is damage to body tissue due to extreme cold, and is most prevalent in extremities.
Hypothermia	Hypothermia is characterized by symptoms such as uncontrollable shivering, disorientation, memory loss, drowsiness, and slurred speech. It occurs due to dangerously low body temperature and most often occurs between temperatures of thirty to fifty degrees.

Source:NWS, 2020

Table 5.4.3-8. Health Effects of Extreme Heat

Health Hazard	Symptoms
Sunburn	Redness and pain. In severe cases: swelling of skin, blisters, fevers, and headaches
Dehydration	Excessive thirst, dry lips, and slightly dry mucous membranes
Heat Cramps	Painful spasms, usually in muscles of legs and abdomen, and possible heavy sweating
Heat Exhaustion	Heavy sweating; weakness; cold, pale and clammy skin; weak pulse; possible fainting and vomiting
Heat Stroke	High body temperature (104 ºF or higher), hot and dry skin, rapid and strong pulse, and possible coma

Source: NYS DHSES 2014

In addition, safety issues include not only health-related impacts, but domicile impacts as home fires occur more often in winter than any other season (FEMA, 2019).

Meteorologists can accurately forecast extreme heat and cold event development and the severity of the associated conditions with several days of lead time. These forecasts provide an opportunity for public health and other officials to notify vulnerable populations, implement short-term emergency response actions, and focus on surveillance and relief efforts on those at greatest risk. Adhering to extreme temperature warnings can significantly reduce the risk of temperature-related deaths.

Impact on General Building Stock

All the building stock in the county is exposed to the extreme temperature hazard. Refer to Section 4 (County Profile), which summarizes the building inventory in Chenango County. Extreme heat generally does not impact buildings; however, elevated summer temperatures increase the energy demand for cooling. Losses can be associated with the overheating of heating, ventilation, and air conditioning (HVAC) systems. If warner temperatures are sustained for a longer period, concrete and asphalt roadways can breakdown and cause damage to vehicles and lead to road closures. Extreme cold temperature events can damage buildings through freezing/bursting pipes and freeze/thaw cycles, as well as increasing vulnerability to home fires. Additionally, manufactured homes (mobile homes) and antiquated or poorly constructed facilities can have inadequate capabilities to withstand extreme temperatures.

Impact on Critical Facilities

All critical facilities in the county are exposed to the extreme temperature hazard. Impacts to critical facilities are the same as described for general building stock. Additionally, it is essential that critical facilities remain operational during natural hazard events. Extreme heat events can sometimes cause short periods of utility failures, commonly referred to as *brown-outs*, due to increased usage from air conditioners and other energy-intensive appliances. Similarly, heavy snowfall and ice storms, associated with extreme cold temperature events, can cause power interruption. Backup power is recommended for critical facilities and infrastructure. Extreme temperature events can damage roadways, leading to potential road closures and impacting accessibility to areas around the County. This could disrupt emergency access and response time.

Impact on Economy

Extreme temperature events also have impacts on the economy, including loss of business function and damage to and loss of inventory. Business-owners can be faced with increased financial burdens due to unexpected repairs caused to the building (e.g., pipes bursting), higher than normal utility bills, or business interruption due to power failure (i.e., loss of electricity, telecommunications).

The agricultural industry is most at risk in terms of economic impact and damage due to extreme temperature events. Extreme cold events can result in impact on crops due to a late freeze and facilities such as barns are more vulnerable to fire in the winter. Extreme heat events can result in drought and dry conditions and directly impact livestock and crop production. Based on information from the 2017 Census of Agriculture, 770 farms were present in Chenango County, encompassing 148,982 acres of total farmland. The average farm size was 193 acres. Products sold from Chenango County farms had a total market value of $67.9 million ($41.6 million: milk from cows, $9.3 million: other crops and hay, $6.8 million: cattle and calves, $5.5 million: grains, oilseeds, dry beans, and dry peas). The 2017 Agricultural Census indicated that 643 farm operators reported farming as their primary occupation (USDA 2017).

Impact on the Environment

Extreme temperature events can have a major impact on the environment. For example, freezing and warming weather patterns create changes in natural processes. An excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources (USGS 2020). Likewise, rain-on-snow events also exacerbate runoff rates with warming winter weather. Extreme heat events can have particularly negative impacts on aquatic systems, contributing to fish kills, aquatic plant die offs, and increased likelihood of harmful algal blooms. Refer to Section 5.4.5 (Harmful Algal Bloom) for more information about the impact of extreme temperatures on HABs in Chenango County.

Cascading Impacts on Other Hazards

Extreme temperature events can exacerbate the drought hazard, increase the potential risk of wildfires, and escalate severe storm and severe winter weather events for the County. For example, extreme heat events may accelerate evaporation rates, drying out the air and soils. Extreme heat can also dry out terrestrial species, making them more susceptible to catching fire. Extreme variation in temperatures could create ideal atmospheric conditions for severe storms or worsen the outcome of severe winter weather during freezing and thawing periods. Refer to Section 5.4.2 (Drought), Section 5.4.8 (Severe Storm), Section 5.4.9 (Severe Winter Storm), and Section 5.4.10 (Wildfire) for more information about these hazards of concern.

Future Changes that May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development and Change in Population

The ability of new development to withstand extreme temperature impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. New development will change the landscape where buildings, roads, and other infrastructure potentially replace open land and vegetation. Surfaces that were once permeable and moist are now impermeable and dry. These changes cause urban areas to become warmer than the surrounding areas forming an *island* of higher temperatures (U.S. Environmental Protection Agency [EPA] 2019). Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

According to population projections from the Cornell Program on Applied Demographics, Chenango County will continue to experience a population decrease through 2040 (a decline of over 7,500 people in total by 2040). This decrease will reduce the overall vulnerability of the county's population over time. Refer to Section 4.5.2 (Population Trends) in the County Profile for a detailed discussion on population changes.

Climate Change

As discussed earlier, Chenango County is projected to experience increases in the average annual temperature by 4.4–6.3 ºF by the 2050s and 5.7–9.9 ºF by the 2080s. As the climate warms, extreme cold events might decrease in frequency, while extreme heat events might increase in frequency; the shift in temperatures could also result in hotter extreme heat events. With increased temperatures, vulnerable populations could face increased vulnerability to extreme heat and its associated illnesses, such as heatstroke and cardiovascular and kidney disease. Additionally, as temperatures rise, more buildings, facilities, and infrastructure systems may exceed their ability to cope with the heat.

Change of Vulnerability Since the 2015 HMP

Overall, the entire county remains vulnerable to extreme temperatures. As existing development and infrastructure continue to age they can be at increased risk to failed utility systems (e.g., HVAC) if they are not properly maintained. Similarly, an increase in the elderly population remaining in the county increases the vulnerable population.