PUBLIC UTILITY LAW PROJECT OF NEW YORK

Heat Island Designations in New York State

April 2026

Contents

PULP's definition of a heat island

Definition

PULP defines a heat island as a locality that faces **elevated risk due to two or more** of the following conditions:

- High heat exposure
- High heat vulnerability
- Little prevalence of air conditioning
- High household energy burden
- The presence of a large load data center

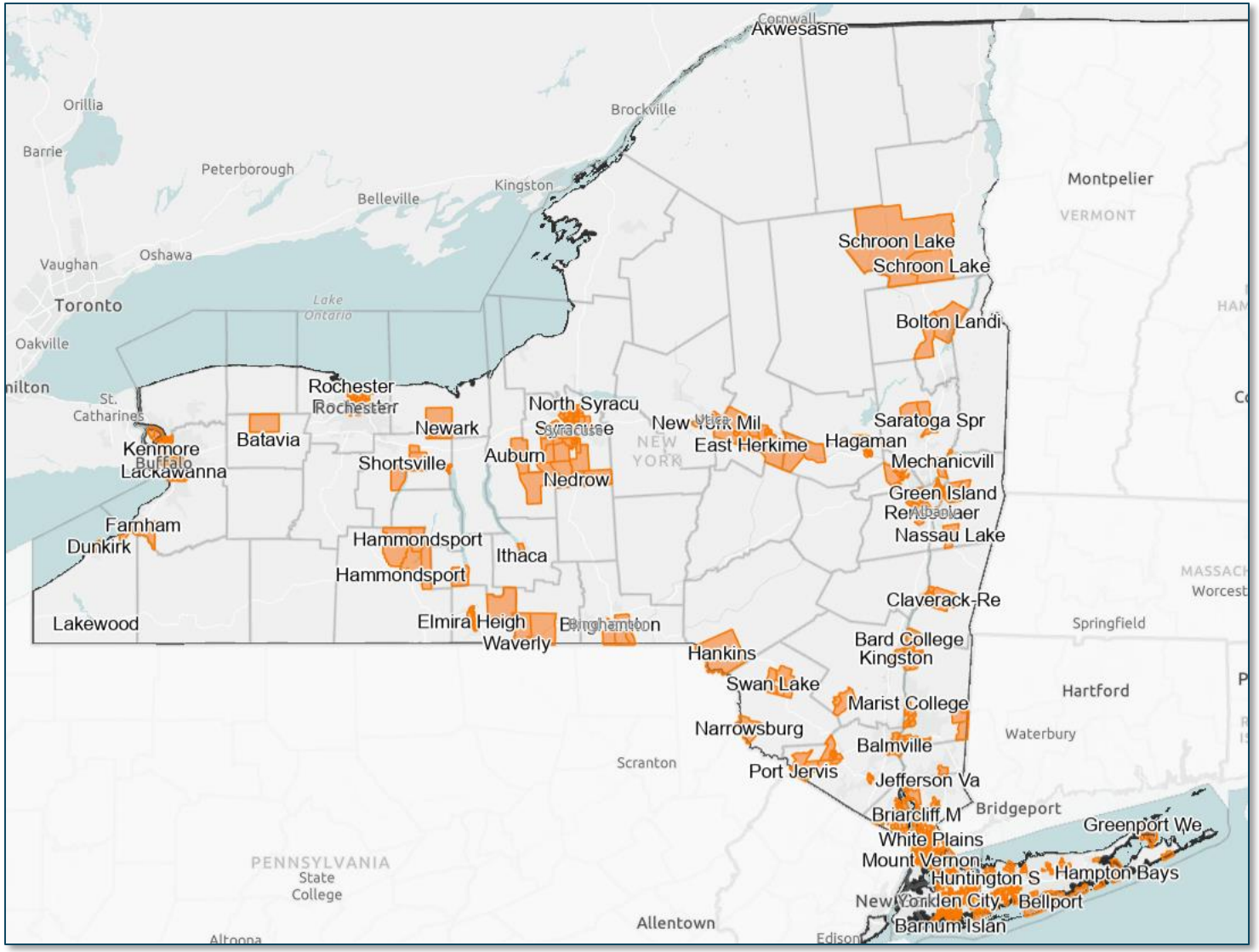
PULP's position on heat island boundaries

Boundaries
Geographic locations for heat islands defined at the locality-level, as it's identifiable for residents and includes all municipalities, plus hamlets and smaller areas.
Weather stations PULP believes that Mesonet weather stations provide the most comprehensive and local throughout the state. Because this is cost prohibitive for our analysis, we used local weather data from PRISM, a gridded dataset
Datasets used in heat island determination In addition to using hyperlocal weather station data, PULP believes that datasets that provide current and historical data provide the most accurate picture of changes to chronic heat over time. Additionally, we believe this data must be overlayed with vulnerability data to accurately portray a locality's sensitivity to shutoff after a high heat day. Read more in our Data Sources and Recommendations.

Results

Preliminary findings:

- 249 localities identified as heat islands in NYS, excluding NYC
- The localities flagged span 35 New York counties
- Nassau county has the highest number of localities identified (66), followed by Suffolk (44), and Westchester (25)
- Most localities (120) were flagged due to **four** critical factors above the state median



For a list of the Top 25 localities, please refer to the Appendix here. Full list is available via Excel.

Methodology: Overview

Overview	PULP conducted a local-level heat island analysis across New York State to identify localities that face elevated heat risk and warrant enhanced consumer protections during extreme heat events. The analysis integrates climate exposure, population vulnerability, energy burden, and the presence of large load data centers.
Geographic analysis	The primary unit of analysis is the locality (excluding New York City). Census-tract–level data were spatially linked to localities to ensure findings reflect how residents experience heat at a local scale.
Heat exposure	Daily maximum air temperature and dewpoint data (2000–2025) from PRISM were used to calculate heat index values for each locality. These data were used to measure heat frequency days ≥90°F), heat intensity (average and extreme summer heat index), and heat persistence (multi-day extreme heat events). Localities exceeding statewide medians in any of these metrics were flagged for elevated heat exposure. If one or more metric was met, it was flagged for review.
Heat vulnerability	Heat vulnerability was assessed using the NYS Department of Health Heat Vulnerability Index (HVI). Census tracts in the top quartile of statewide HVI scores were identified and aggregated to the municipal level. Localities where 10% or more of associated tracts ranked in the top 25% statewide were classified as highly heat vulnerable.
Energy burden and affordability	Energy burden was evaluated by estimating the share of household income spent on energy costs. Localities in which household energy costs exceeded the median energy cost for the state were identified as energy burdened, reflecting increased risk during heat events that require sustained cooling.
Large load data centers	CleanView was were used to identify localities hosting one or more large load data centers (≥20 MW), including AI and cryptocurrency mining facilities. These localities were flagged due to documented data center–induced microclimate effects and elevated local heat, water, and energy demand.
Air conditioner vulnerability	AC vulnerability was measured using tract-level estimates of the share of households without air conditioning, which was aggregated to the locality level. The average no-AC share captured the prevalence of the lack of AC. Next, we looked at the 90th percentile of the no-AC share. Together, these measures were used to identify localities where limited access to in-home cooling. The energy burden proxy, paired with this, tells us where residents may face affordability constraints with cooling.
Heat island designation	A locality is designated as a heat island if it meets two or more of the criteria above. This inclusive framework reflects PULP's focus on preventing harm to residents who may face severe health risks during extreme heat, even if driven by different underlying factors.

For all data sources, please refer to the Appendix here.

PULP's definition of a heat island includes climate- and socioeconomic vulnerability components (1 of 2)

Category	Indicator	Thresholds	Source
Heat exposure	**90th Percentile Summer Heat Index**	If a locality was in the 90th percentile for summer heat index values, a flag for elevated PRISM values was created.	PRISM
	Median days at 90°F and 95°F Heat Index	If a locality significantly exceeded the statewide median number of sustained heat events (defined at 2 or more days above 90F heat index), a flag for elevated PRISM values was created.	PRISM
	90th Percentile sustained heat index runs	If a locality significantly exceeded the statewide median for heat index frequency, intensity, and/or persistence, a flag for elevated PRISM values was created.	PRISM
	Heat Burden Score	Averaged z-scores for the above indicator values and formed a composite score to provide an overall view of the locality.	PRISM
Heat vulnerability	**Median HVI**	Localities containing 10% or more of its census tracts with a heat vulnerability index (HVI) in the top 25% of scores across the state.	NYS DOH
	90th Percentile HVI Value	If a locality's census tracts were in the 90th percentile for HVI value, a flag was created.	NYS DOH
	Percent Share of Tracts HVI	The percentage share of the tracts that were designated as heat vulnerable, not a standalone metric but a supporting HVI metric to determine both where vulnerability was high across tracts or where it was severe in heavily burdened tracts.	NYS DOH

PULP's definition of a heat island includes climate- and socioeconomic vulnerability components (2 of 2)

Category	Indicator	Thresholds	Source
AC Adoption and Cost	**90th Percentile w/o AC share**	Localities that fell into the 90th percentile share of without AC were flagged as heavily burdened by lack of mitigation.	ACS 2024 Housing Data
	Avg. Share of Households w/o AC	Localities where a significantly above the median number of households reported no access to air conditioning. If a tract had a high energy burden and a high rate of no access to AC, we factored this in as a signifier that the cost of mitigation would be a risk factor.	ACS 2024 Housing Data
	Max w/o AC Share	Identified most severely burdened tracts.	ACS 2024 Housing Data
Energy burden	**Mean Energy Burden and Affordability Proxy**	Localities facing energy costs significantly over the median energy burden were included for review (also examining overall costs of utilities, including water and fuel, and housing costs).	ACS 2024 Housing Data
Data centers	**Existence of 1+ large load data center**	Existence of one or more large load (AI, crypto-mining operations of => 20 MW) data centers in locality.	CleanView

Considerations: New York City

PULP identifies **all five boroughs of New York City as a heat island**, which appears to be consistent with early findings from ConEdison.

- New York City has the oldest housing stock in the state based on NYSERDA's 2019 Residential Building Stock Assessment, with the survey's average home age in NYC at around 65 years old[1]. Older housing stock retains heat and can lead to vastly higher indoor air temperatures.

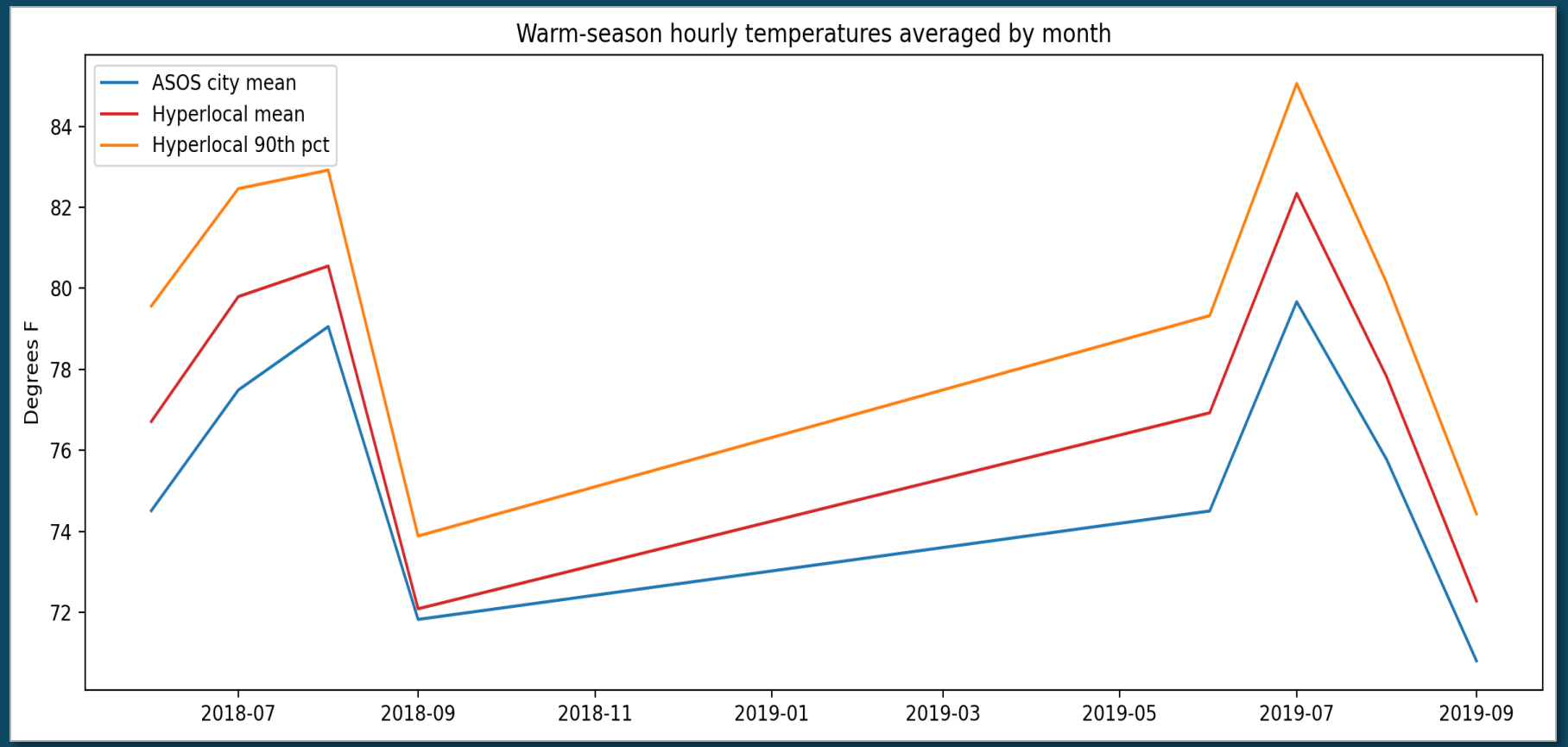
- New York City's heat index is a median of 8.9°F hotter than all other major cities in New York State
  - PULP analyzed hyperlocal 2018 NYC weather data collected by the Department of Health and Mental Hygiene[2] against the ASOS/AWOS data that indicates that neighborhood weather runs hotter than the ASOS stations that would be used in the extreme heat order.
  - While using the Wall Street station partially alleviates this difference, all neighborhoods run about 2F hotter than ASOS/AWOS stations on average and higher density neighborhoods ranged 4-9F hotter than all ASOS/AWOS stations on average.

PULP believes this analysis, and existing health and safety data from the DOHMH, is supportive of the proposal that all of New York City should be considered a heat island for the purpose of this proceeding, as New York City's infrastructure creates hotter temperatures indoors and outdoors for residents around the city.

1. NYSERDA Residential Building Stock Assessment Report
2. Department of Health and Mental Hygiene NYC Heat Vulnerability Index

Considerations: New York City

In 2018 and 2019's warm seasons, hyperlocal temperature are warmer than those measured by the ASOS mean temperatures for New York City.



Sources:
https://mesonet.agron.iastate.edu/request/download.phtml?network=NY_ASOS
https://data.cityofnewyork.us/dataset/Hyperlocal-Temperature-Monitoring/qdq3-9eqn

Considerations: Data center microclimates

PULP believes the following localities should have heat island protections due to the existence of operational large load AI/CMO data centers.[1]

Locality	County	Data Center	Year operational	Capacity (MW)	Identified by other heat island indicator?
Lockport	Niagara	Lake Mariner - CB-1 and CB-2	2025	70	Y
Blauvelt	Rockland	LGA3 data center (1)	2025	40	Y
Blauvelt	Rockland	LGA3 data center (2)	2025	20	Y
Blauvelt	Rockland	Orangeburg Data Center	2025	20	Y

Rationale:

- Large load data centers (annual capacity of 20 MW or more) used for AI and cryptocurrency mining operations can have significant impacts on the heat, energy demand, and water quality and quantity for their surrounding communities.[2]
- A study conducted by the University of Cambridge and other contributors has coined the 'data heat island effect,' estimating that land surface increase by an average of 3.6°F (2°C) after the start of hyperscale AI data center operations, creating local microclimate zones.[3]

1. https://cleanview.co/public/data-centers/new-york#data-centers-map
2. UnconstrainedDemand_SinglePage.pdf
3. Research: (PDF) The data heat island effect: quantifying the impact of AI data centers in a warming world

Our recommendations: 2027 and beyond

1. Incorporate utility residential arrears data to estimate energy burden.
2. Conduct an adequate analysis for rural areas:
   a. Integrate soil moisture and drought data which impacts heat indexes in rural areas.
   b. Analyze canopy scarcity related to agricultural operations and crop moisture impacting air temperature.
3. Include public health analysis from the health-related impacts on extreme heat and utility disconnections.
4. Incorporate large load data centers into localities designated as they become operational.
5. Incorporate centroid of census tract to nearest hospital as a risk factor for rural areas and DACs
6. Use historical heat analyses, rather than solely prior year, to inform how weather cycles and climate change have impacted localities over time.
7. Review localities marked as ‘monitor’, meaning they had fewer than two conditions flagged.

Appendix

Appendix A: Top 25 localities flagged in NYS (excluding NYC)

Locality	County	High prevalence no A/C	Elevated heat exposure	High HVI burden	High HVI urban override	>10% of census tracts flagged	High energy burden	Large load data center
Marist College	Dutchess	X	X	X	X	X	X	
Poughkeepsie	Dutchess	X	X	X	X	X	X	
Beacon	Dutchess		X	X	X	X	X	
Rensselaer	Rensselaer		X	X	X	X	X	
Watervliet	Albany		X	X	X	X	X	
Albany	Albany		X	X	X	X	X	
Rhinecliff	Dutchess		X	X	X	X	X	
Green Island	Albany		X	X	X	X	X	
Wyandanch	Suffolk		X	X	X	X		
Merritt Park	Dutchess		X	X		X	X	
Cohoes	Albany		X	X		X	X	
Bard College	Dutchess		X	X		X	X	
Westmere	Albany		X	X		X	X	
Tonawanda	Erie			X	X	X	X	
Hankins	Sullivan			X	X	X	X	
Spackenkill	Dutchess		X	X		X	X	
Schenectady	Schenectady		X	X		X	X	
Horseheads North	Chemung		X	X		X	X	
Sloan	Erie			X	X	X	X	
Binghamton	Broome			X	X	X	X	
Silver Creek	Chautauqua	X		X	X	X	X	
Buffalo	Erie			X	X	X	X	
Wingdale	Dutchess		X	X	X	X	X	
Little Falls	Herkimer		X	X		X	X	
Farnham	Erie	X		X		X	X	

Appendix B: Data sources (1 of 2)

Source	Measure(s)	Definition	Purpose
NYS Department of Health	**Heat Vulnerability Index (HVI)**	Vulnerability to heat is how likely a person is to be injured or harmed during periods of hot weather. Heat vulnerability has been linked to individuals' characteristics (health status, age, race, income, language spoken, etc.) as well as certain aspects of the community where one lives (environment, community demographics).	Helps determine vulnerability status of NYS residents to extreme heat based on language, socioeconomic, environmental, and elderly isolation vulnerability factors.
The PRISM Group	**(1) Max air temperature (2) Average dewpoint**	Used these measures to determine heat exposure through a variety of measures: heat frequency (number of annual days above 90°F), heat intensity (the average summer temperature, median heat index, and 90th percentile heat index), and the heat persistence (max consecutive days above 90F, multi-day heat event counts per locality).	Used measures to determine the heat frequency, intensity, and persistence for NYS localities.
Calculation	**Heat index**	Calculated heat index for all localities using max air temperature and the average dewpoint for each day from 2000-2025, using the Magnus-Tetens approximation formula to find relative humidity, which was used to find heat index using the NOAA heat index equation.	Calculated heat index to understand impacts of hot temperatures combined with humidity to determine 'feels like' temperatures.
Calculation	**Census tract to locality crosswalk**	Census tracts were linked to localities using a spatial proximity-based crosswalk that associated each locality point with nearby census tracts and summarized tract-level Heat Vulnerability Index values into municipality-level vulnerability indicators.	Used to identify heat island localities as most people do not know their census tract but still keeps analysis at relatively local level (more granular than county-level).
CleanView	**Data Center locations in NYS**	Provides information of existing data centers in NYS including their name, load size in MW, year operational, and more.	Used to determine which NYS localities had large load data centers.

Appendix B: Data sources (2 of 2)

Source	Measure(s)	Definition	Purpose
ACS Housing Data 2024 5-year Estimates	**Household income; household electric, gas, fuel, water, rent, and mortgage cost**	Data collected through ongoing annual surveys providing detailed population and household estimates. It is used to understand, measure, and plan for communities, providing information on over 40 social, economic, housing, and demographic topics.	To determine energy burden
ASOS/AWOS Data from Iowa Mesonet	**Heat index, max temp at 2 meters**	This is the NWS data primarily collected from airports.	Comparing with Hyperlocal NYC Weather Data
Nationwide Residential Air Conditioning Prevalence in the United States	**Air conditioning prevalence**	This dataset breaks down AC prevalence by metro and census tract	To determine what areas were most likely to experience risk due to lack of mitigation
Hyperlocal Temperature Monitoring	**Temperature and heat index at the neighborhood level in NYC**	This is a study of temperature at the neighborhood level in 2018 in NYC.	To review NYC heat at the granular level