



# Extreme Heat Action Planning

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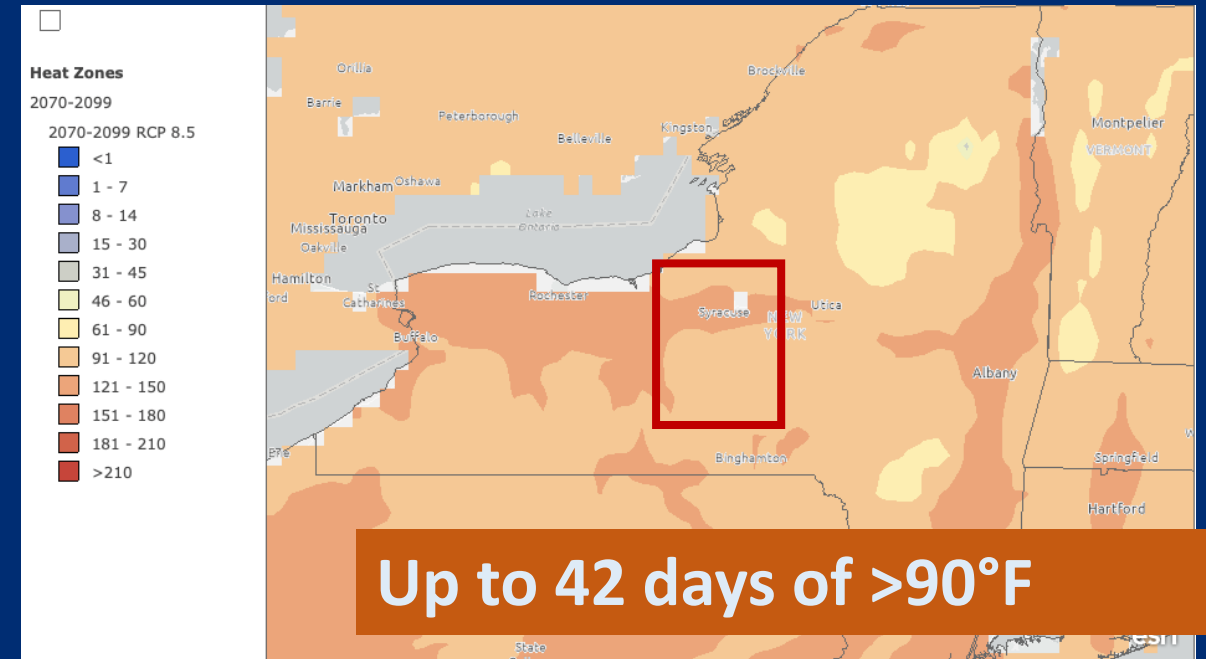
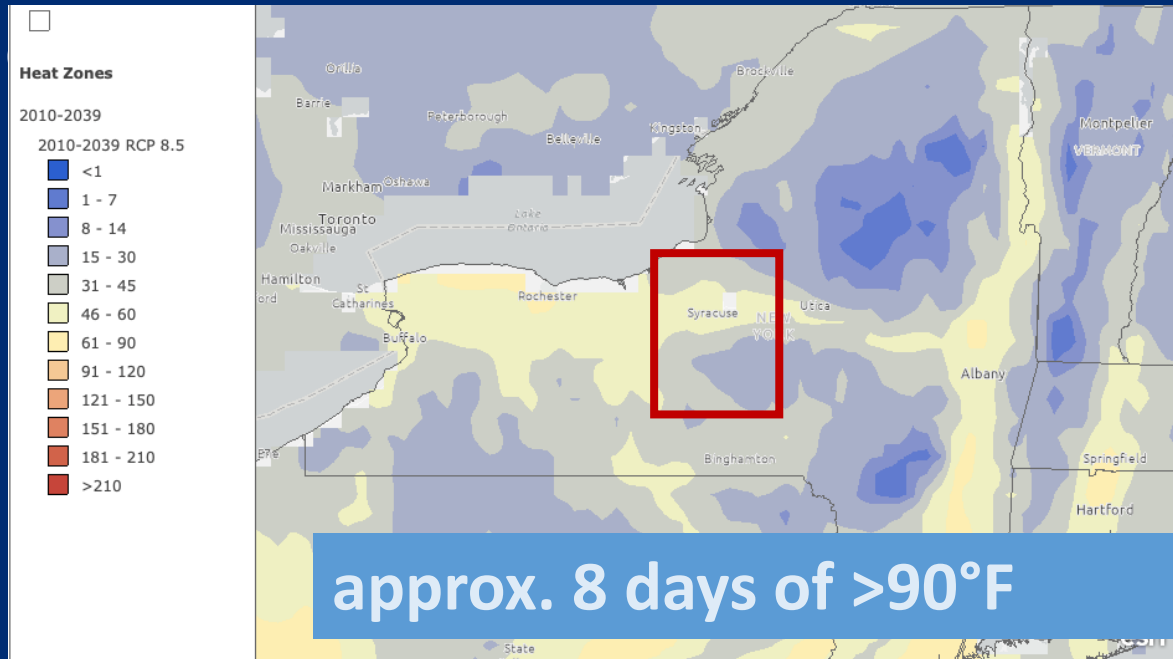
## NYS Upstate APA Mini-Conference

September 15, 2023 – Syracuse, NY

Leo Matteo Bachinger, PHD

NYS Department of Environmental Conservation, Office of Climate Change

# CLIMATE PROJECTIONS



## SOURCES

USFS Heat Zones Mapper. Days above 30°C (86°F)

For days >90°F: NYS ClimAID Report of 2014;

- Baseline 1971-2000
- 2050: 90<sup>th</sup> percentile of 33GCMs and 2RCPs



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**CURRENT AND FUTURE IMPACTS**

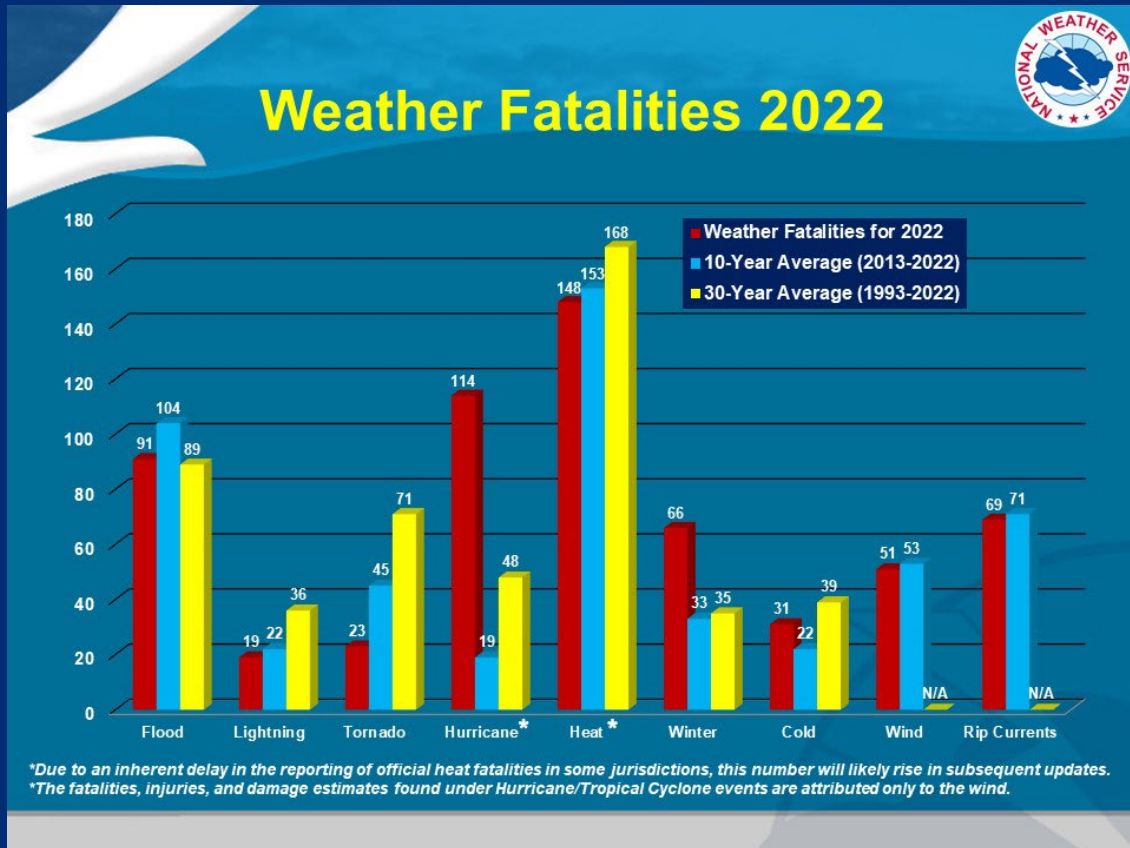
**NYS EXTREME HEAT ACTION PLANNING**

**(SOME) STRATEGIES AND TOOLS**



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# WHY TALK ABOUT EXTREME HEAT?

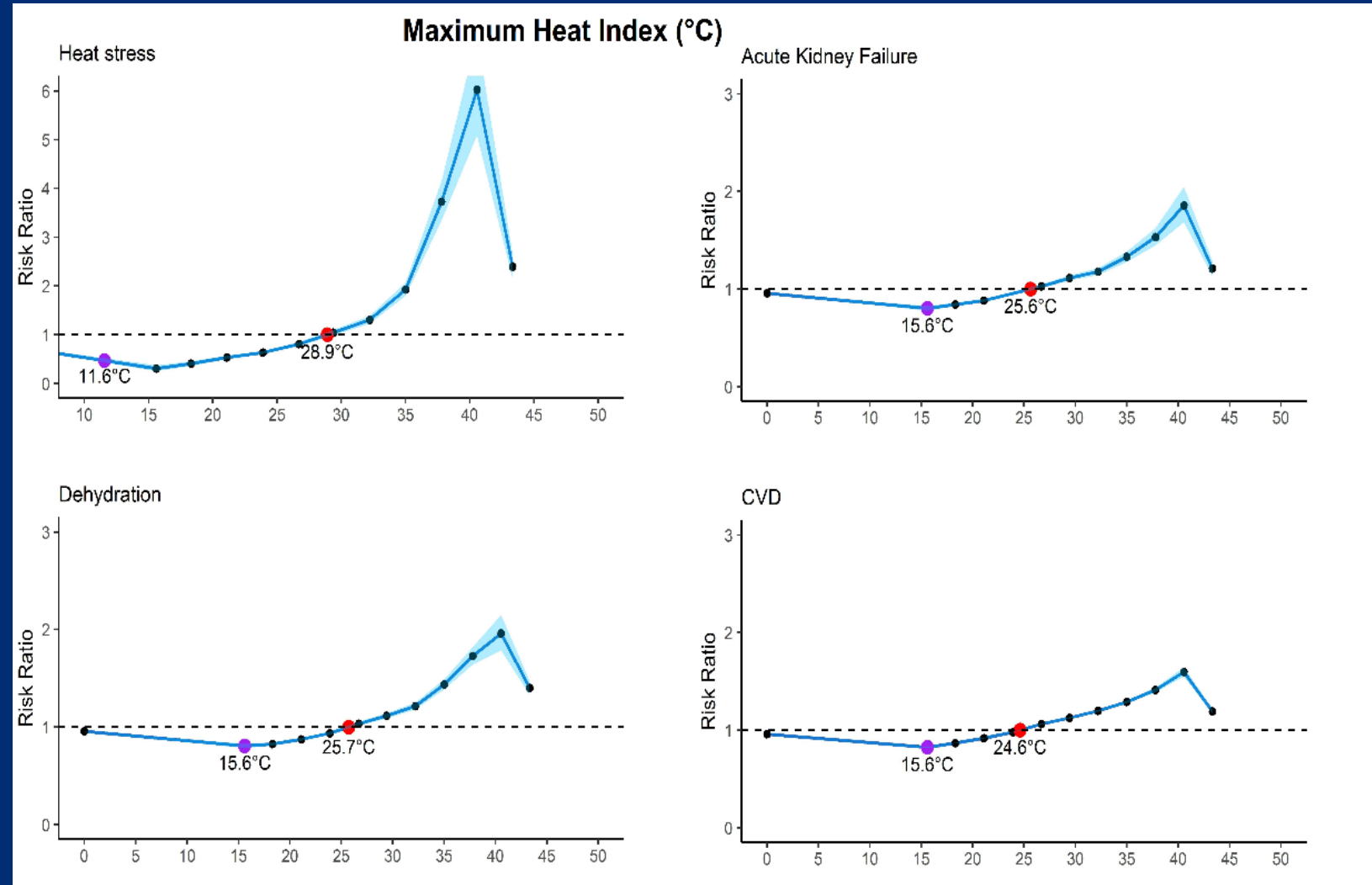


**EXTREME HEAT IS  
THE LEADING CAUSE  
OF DEATH AMONG  
WEATHER-RELATED  
DISASTER EVENTS**



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# Heat and ED visits



# Temperature Does Not Equate to the Experience of Heat





RADIO CITY

RADIO CITY THEATRE



A wide-angle photograph of a city street during sunset. The sky is a warm, hazy orange. Tall, modern skyscrapers line both sides of the street. In the foreground, a yellow taxi is driving away from the camera. Pedestrians are visible on the sidewalks. A prominent vertical sign on the right side of the street reads "RADIO CITY" in red neon. Another sign at the bottom right says "RADIO".

**WHAT AIR ARE  
YOU BREATHING?**

**IS IT HUMID  
OUTSIDE?**

**WHEN DID IT  
LAST RAIN?**

A photograph of a busy city street at dusk. Tall buildings line the street, and a yellow taxi is visible in the foreground. The sky is a warm orange color. Several orange text boxes are overlaid on the image, asking questions about housing and urban environment.

**WHAT'S YOUR  
HOUSING STOCK?**

**IS THERE SHADE?  
IS THERE GREEN SPACE?**

**CONCRETE?  
OPEN SPACE?**

**DO YOU HAVE AIR  
CONDITIONING?  
(CAN YOU AFFORD  
RUNNING IT?)**

A photograph of a busy city street at dusk. Tall buildings line the street, and a yellow taxi is visible in the foreground. The sky is a warm orange color. Four orange text boxes are overlaid on the image, each containing a question.

**WHO IS  
LIVING HERE?**

**HOW IS PUBLIC  
SPACE UTILIZED?**

**WHERE AND HOW  
DO THEY LIVE?**

**HOW ARE THEY  
MOVING  
AROUND?**

**WORKPLACE  
EXPOSURE**



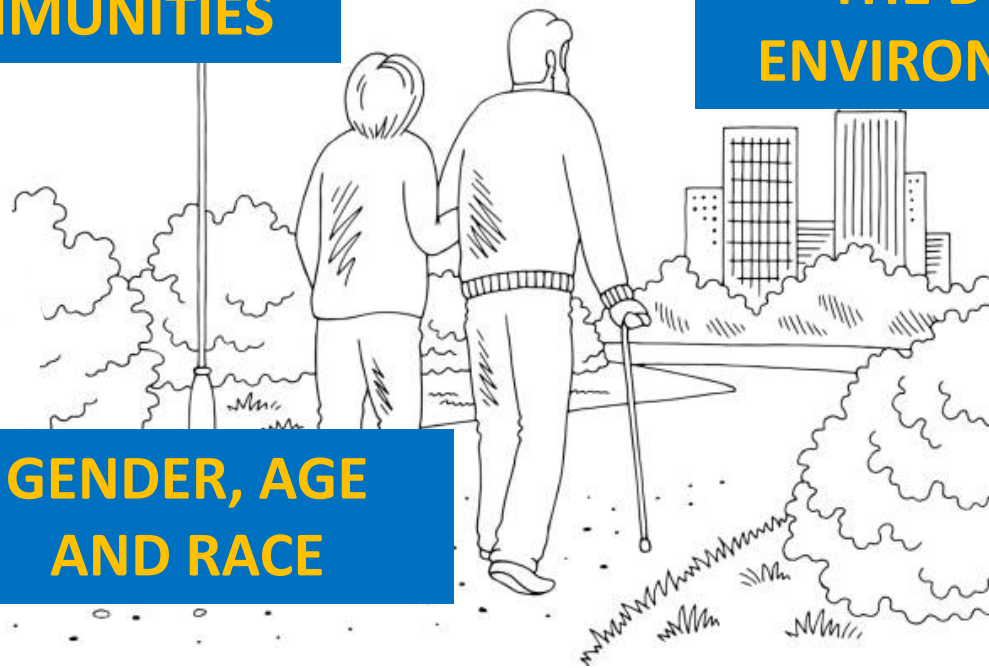
**VULNERABLE  
COMMUNITIES**

**THE BUILT  
ENVIRONMENT**

**HOUSING  
INSECURITY**



**GENDER, AGE  
AND RACE**



Sources (images): CC/Stock  
Sources (data): U.S. Census/HUD/NYT/KFF

# WHERE WE LIVE MATTERS FOR HOW EXTREME HEAT IMPACTS US.

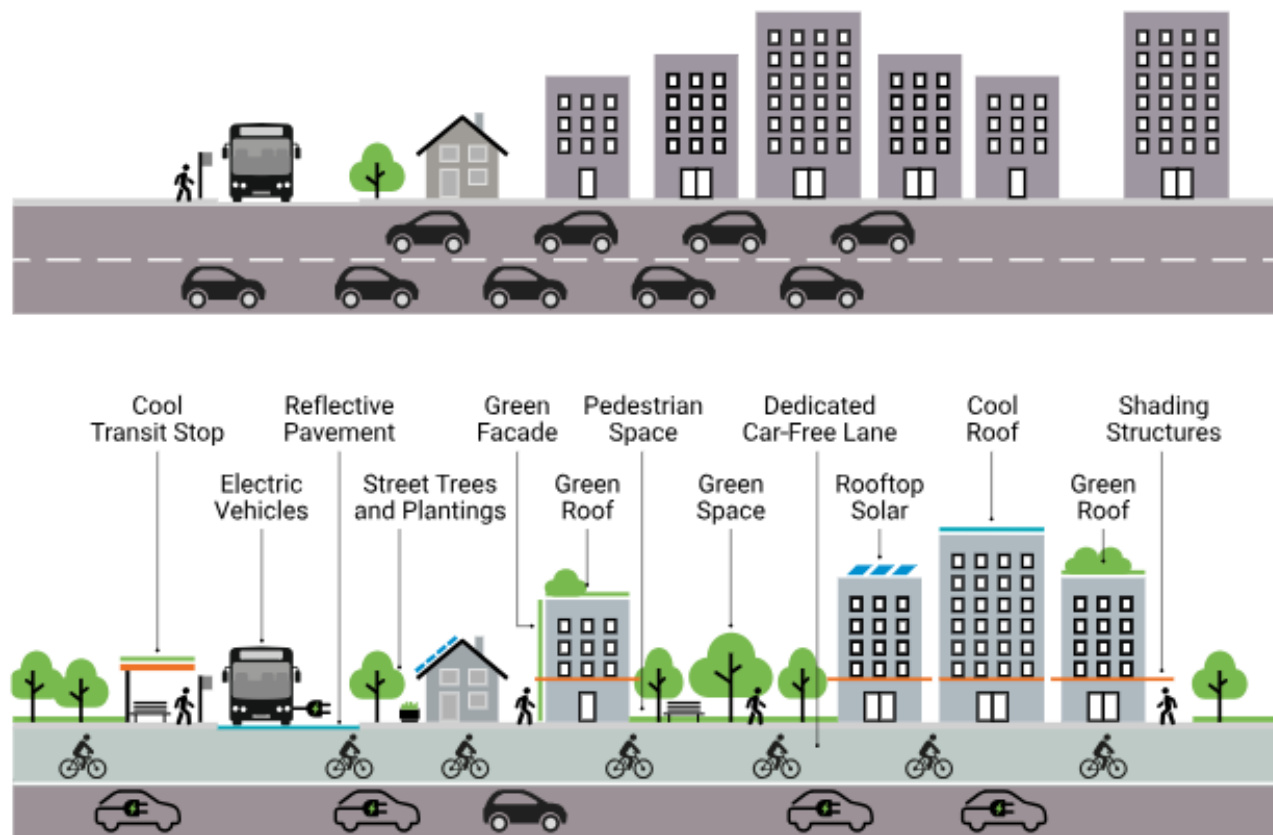
## Do you live in...

- a city, town or village, or in the suburbs?
- an apartment you rent or a house you own?
- near a park, river or forest?
- alone or with others?
- a shelter?
- a place with public transportation?
- a tight-knit community?

Groundwork Hudson Valley: [Climate Safe Neighborhoods](#)



**Figure 6.1** Conventional (top) versus heat-resilient (bottom) urban areas



Source: RMI

Note: In the figure, the conventional urban area has a high proportion of impervious surfaces and single-occupancy vehicles. By comparison, the heat-resilient urban area has a higher proportion of green space, cool surfaces, alternative modes of transport and electric vehicles.

Source: C40 & RMI

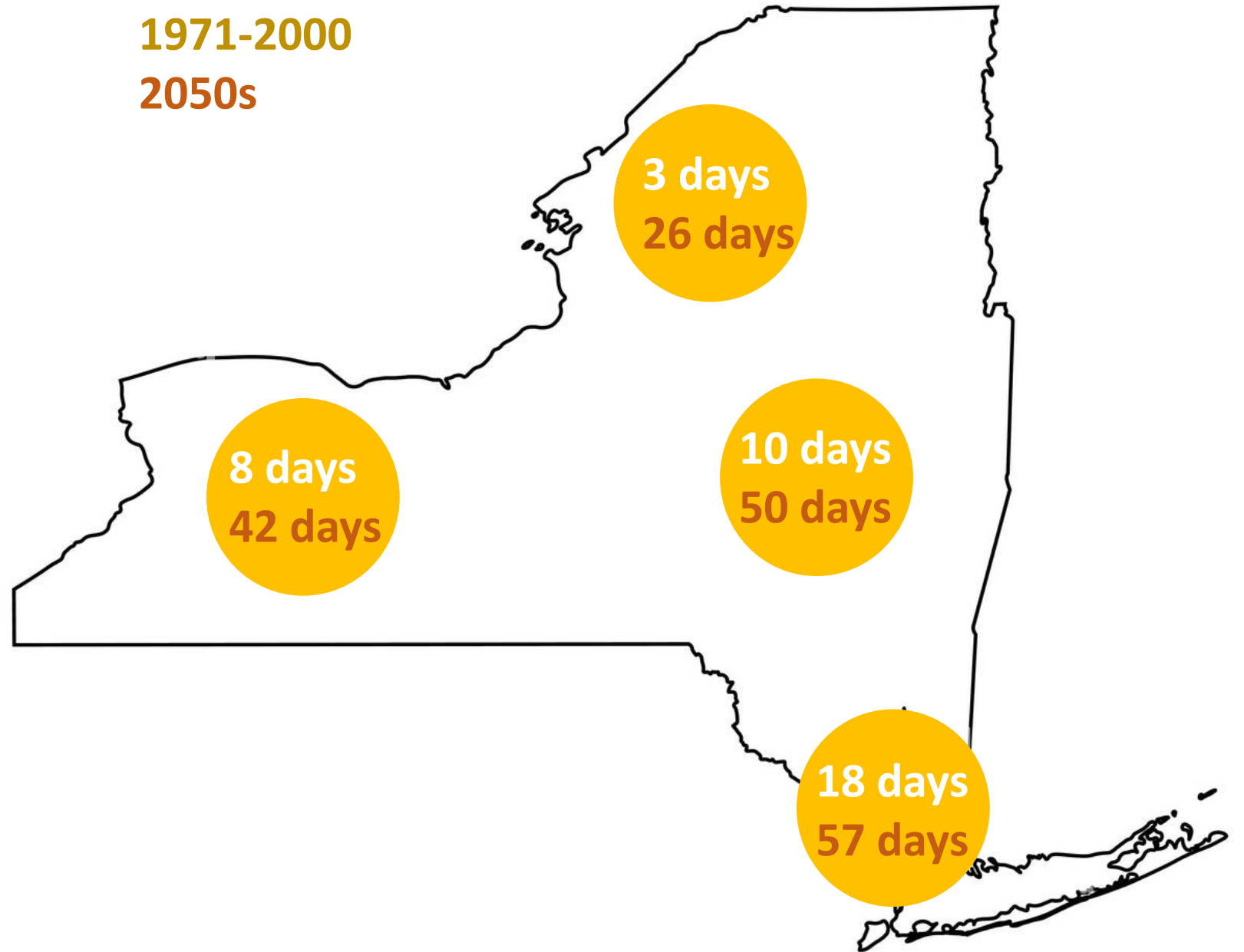


Source: EPA



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# EXTREME HEAT IS BECOMING MORE FREQUENT AND SEVERE



ClimAid Report (2014)  
High estimate projected days >90F

## NATIONAL NEWS

# An Arizona woman died after her power was cut over a \$51 debt. That forced utilities to change

by: ANITA SNOW, Associated Press  
Posted: Jul 24, 2023 / 10:39 AM EDT

## 'A horrible way to die': how extreme heat is killing Italian workers

Factory workers and labourers call for furlough as heat becomes too intense to work in

FILE - Power transmission lines are seen in New Mexico near the Apache-Sitgreaves National Forest, We

## High Heat Raises Risks for Homeless Floridians

## Extreme Heat Can Take Toll on People Battling Mental Health Issues

By HealthDay | July 27, 2023, at 6:41 a.m.

Extreme heat is particularly hard on older adults, and an aging population and climate change are putting ever more people at risk

Published: July 25, 2023 3.48pm EDT



## The race to save baby birds in Phoenix's record heat

During record-runs of extreme heat, some birds tumble from their nests. Many end up at a wildlife



By [Joshua Partlow](#)

July 24, 2023 at 6:00 a.m. EDT

## Deadly extreme heat is spreading, threatening coral reefs and fueling wildfires that compromise air quality

By [Aya Elamroussi](#) and [Eric Zerkel](#), CNN

Updated 9:51 AM EDT, Wed July 26, 2023



## Florida ocean records 'unprecedented' temperatures similar to a hot tub

**The 90-100F readings add to previous warnings over warming water putting marine life and ecosystems in peril**

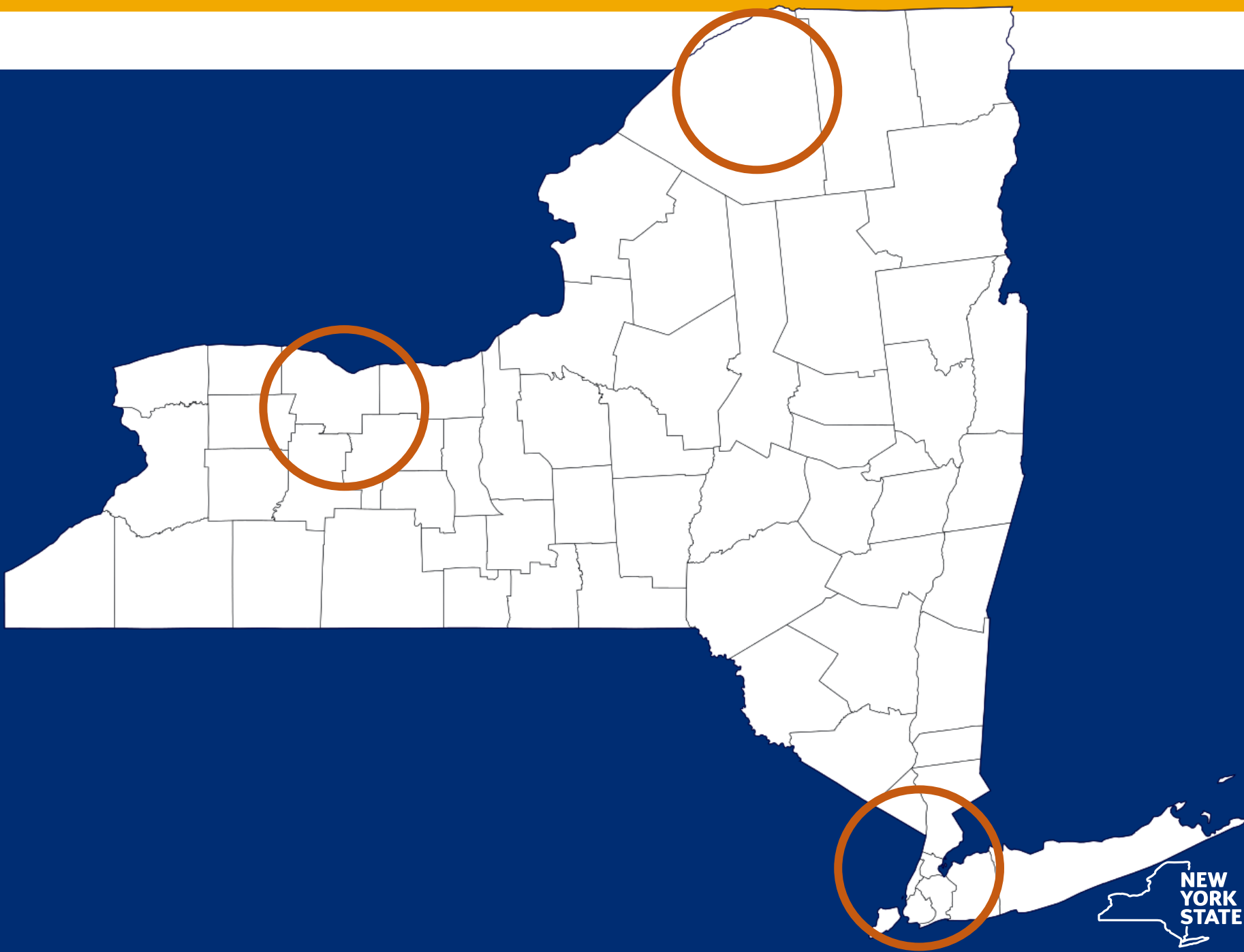
## Rampant heatwaves threaten food security of entire planet, scientists warn

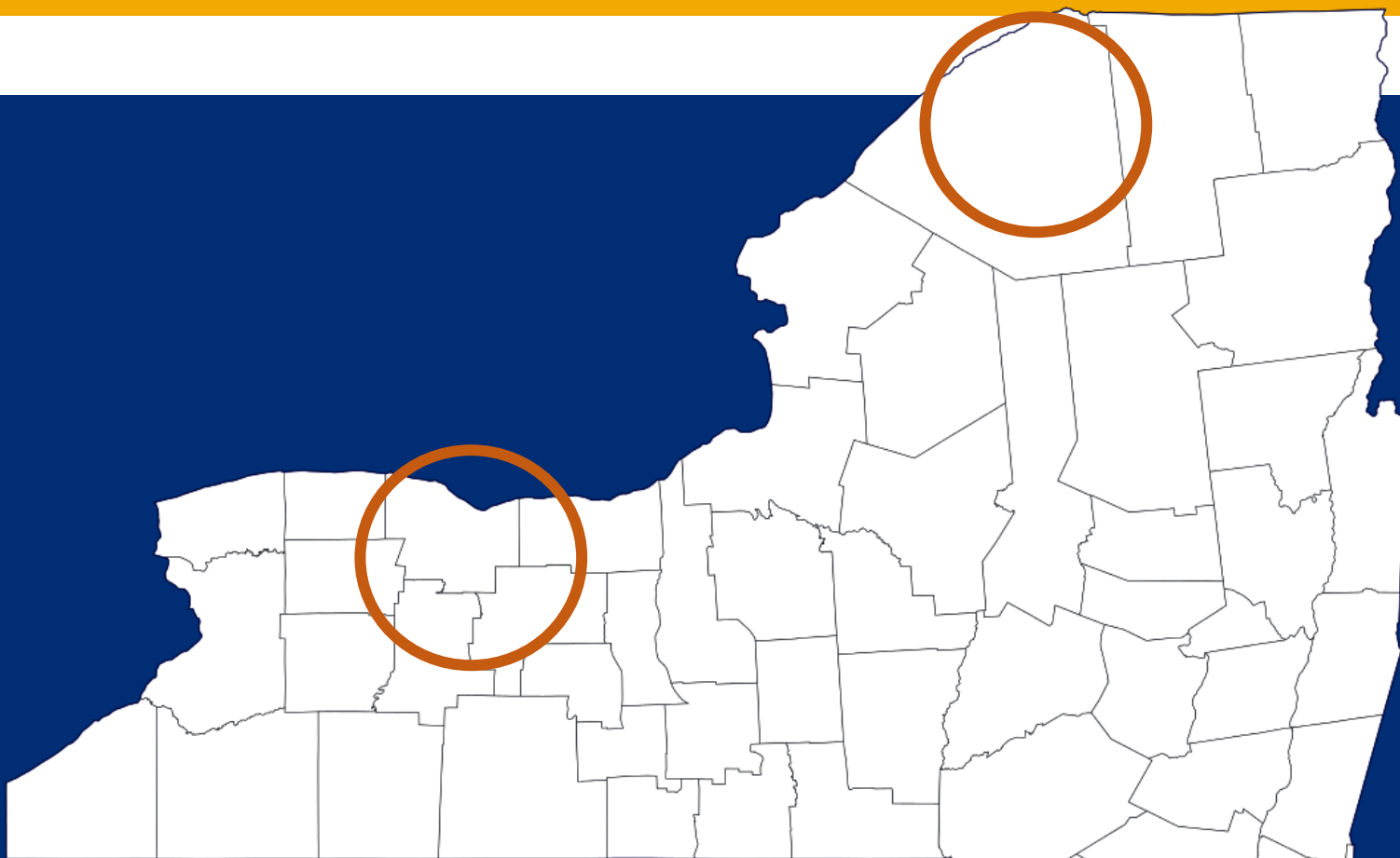
**After hottest day ever, researchers say global heating may mean future of crop failures on land and 'silent dying' in the oceans**

# Impacts of Extreme Heat

Effect	Local Impacts
Longer and More Frequent Heat Waves	<ul style="list-style-type: none"> <li>▪ More people will be affected by the harmful health effects of extreme heat, such as heat stroke or death</li> <li>▪ This is particularly true for vulnerable groups such as children, the elderly, those who work outside, and members of disadvantaged communities</li> </ul>
Increased Demand for Electricity	<ul style="list-style-type: none"> <li>▪ More people will use air conditioners, straining the electric grid and leading to brownouts and/or blackouts</li> <li>▪ In turn, this increase in electricity will lead to the release of more greenhouse gases (GHGs), driving the cycle of climate change</li> </ul>
Alterations to Plant and Animal Species	<ul style="list-style-type: none"> <li>▪ Tree and plant species will continue to shift further northward toward their preferred growing climate, forcing the agriculture sector to identify new crops suitable for a changed climate</li> <li>▪ Pests, like ticks and mosquitos, will live longer as there are fewer freeze events each winter</li> </ul>
Dangers in Urban Areas	<ul style="list-style-type: none"> <li>▪ Heat waves and extreme heat days are exacerbated by urban heat island (UHI) effect, which keeps urban areas hotter for longer (especially at night) as pavement absorbs the heat and releases it slowly</li> <li>▪ Extreme heat leads to stagnant air, which increases the concentration of dangerous particulates like ozone and leading to poor air quality</li> </ul>
Dangers in Rural Areas	<ul style="list-style-type: none"> <li>▪ As more people suffer from heat-related illnesses, small medical facilities will be overwhelmed</li> <li>▪ Many professions take place outdoors, increasing the likelihood people will be exposed to extreme heat; in indoor jobs, many facilities in rural areas do not have adequate access to air conditioning</li> </ul>







**URBAN HEAT ISLANDS**

Baseline: 17 days > 90F

2050: 62 days (75%ile)



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**EMERGENT HAZARD**

Baseline: 2 heat waves/decade  
2050: 3 heat waves/year (75%ile)





**BEYOND URBAN CENTERS**

3.3% > relative heat health risk (APHA)  
Agricultural, natural resource emergencies  
Workers health, recreational activities  
Housing and infrastructure



# NYS Extreme Heat Action Planning

## 2022 STATE OF THE STATE DIRECTIVE:

DEC and NYSERDA to develop an **extreme heat action plan** to address impacts in

- disadvantaged communities;
- areas of employment; and
- recreational zones across the state.





# EXTREME HEAT ACTION PLANNING

WHOLE-OF-GOVERNMENT EFFORT, INVOLVING

**28 State agencies and authorities**

COLLABORATIVE PLANNING PROCESS IN PARTNERSHIP WITH

**community-based organizations**

**local government champions**

**experts and other stakeholders**



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# HEAT ACTION AGENDA FOR 2023

**UHI STUDY**

ASSESS CURRENT &  
FUTURE IMPACTS

**HEAT ANNEX**

PREPARE FOR  
ACUTE EVENTS

**ADAPTATION PLAN**

ACCELERATE  
ADAPTATION

**TOOLS, RESOURCES**

SUPPORT LOCAL  
ACTION & CAPACITY



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**JULY 2022**

NEW YORK STATE Department of Environmental Conservation | NYSERDA

**Interim Recommendations**  
 PREPARING FOR EXTREME HEAT  
 EXTREME HEAT ACTION PLAN WORK GROUP

Kathy Hochul, Governor | Basil Seggos, Commissioner | Doreen Harris, President and CEO

**IDENTIFIES IMMEDIATE ACTION OPPORTUNITIES**

**JUNE 2023**

**New York State Comprehensive  
 Emergency Management Plan**

**Extreme Heat Annex**

NEW YORK STATE | **Disaster Preparedness  
 Commission**

Prepared by the New York State  
 Disaster Preparedness Commission

**COORDINATES THE STATE RESPONSES**

# ADAPTATION PLAN

ACCELERATE  
ADAPTATION

- Develops and promotes adaptation strategies for current and future impacts.
- People-first plan for State action
- Describes strategies in five areas for action:
  - People's health and wellbeing
  - Community & capacity
  - Built environment
  - Infrastructure
  - Ecosystems and natural resources



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# Developing the Plan



## Phase 5: Draft the Plan

While collecting continued feedback, the EHAPWG is currently developing a first draft of the plan, scheduled to be released in **early 2024**. Continued input is welcome, including by:

- ✓ Direct engagement with the EHAPWG – contact [extreme-heat@dec.ny.gov](mailto:extreme-heat@dec.ny.gov)
- ✓ Meet us at workshops, conferences and convenings to discuss the plan
- ✓ Provide feedback upon release of the first iteration of the plan



Phase 1:  
Formulate  
Adaptation  
Goals



Phase 2:  
Assess  
Impacts and  
Vulnerabilities



Phase 3:  
Identify  
Adaptation  
Options



Phase 4:  
Refine  
Adaptation  
Options



Phase 5: Draft  
the Plan



Phase 6:  
Review, refine  
the Plan



Phase 7:  
Release,  
feedback



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# ACTING IN CONCERT WITH IMPACTED COMMUNITIES



# EHAP Forum: By the Numbers

- 17.5 hours across seven meetings
- 211 unique participants with 45 unique community-based organizations (CBOs) and 30 members of municipalities
- 206 total actions reviewed, discussed, and refined
  - Nine prototype actions to inform future efforts
  - 248 pages of notes and discussion
- Engaged communities through attending community events, conferences, county task forces, and student group activities



# Future EHAP Development

The actions list the forum refined and updated during the forums will be further consolidated and verified by the expert panel, CAP, and regional community workshops to ensure the actions are meaningful and impactful to communities across the State.





# ADVISORY BODIES SUPPORT PLANNING

## SCIENCE ADVISORY PANEL

- interdisciplinary panel of state and national experts
- provides expert review of plan components
- develops best practices inventory and evaluation recommendations
- hosts four public capacity and literacy building webinars

## COMMUNITY ADVISORY PANEL

- comprises community-based organizations representing Disadvantaged Communities and otherwise heat-vulnerable groups
- convenes four times to provide external review of major plan components



# Regional Community Workshops

The goal of the Regional Community Workshops was to directly engage with communities across the State to get input to inform the EHAP.

## Objectives:

- Solicit input on implementation of adaptation best practices to be considered for inclusion in the plan
- Brainstorm specific community projects that can be supported through proposed EHAP actions and funding opportunities on the federal, state, and local level
- Build networks and relationships between local stakeholders to enhance community resilience
- Prepare community partners for future coordination (e.g., funding proposals)



Locations		
▪ Albany	▪ Long Island	▪ New York City
▪ Yonkers	▪ Rochester	▪ Buffalo
▪ Utica		



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# Some insights

- Coordinated and **early communication** is critical.
- Take stock and **raise visibility of existing resources** in the community (e.g., cooling centers).
- Greater **regional connection and coordination** among grassroots organizations, local government entities, and state agencies is needed.
- Prioritize funding to **support locally embedded organizations** that serve and represent the communities.



# Some insights

- Solutions and services need to better consider **how to assist individuals living in rural and isolated locations.**
- Additional guidance is needed in **navigating existing services and resources.**
- Extreme heat emergency and health information often **does not reach key vulnerable groups.**



# BUILDING CAPACITY THROUGH PLANNING

- **Reimbursement** for participants through NYSERDA
- **Training** and **building literacy** in adaptation planning through participation
- Regional **input workshops = planning & implementation** workshops
- Planning and **decision-support tool** development
  - heat impacts,
  - vulnerabilities,
  - best and promising practices
  - metrics and indicators
  - federal, state and foundation funding



# Strategies for Adaptation

There is **no one-size fit all** solution  
– but several tools and strategies.

Build on **what is already  
in place** locally.

Leverage existing and create new  
**regional partnerships.**

Pursue solutions that address  
**multiple challenges & benefits.**



# Common Solutions

Source: American Planning Association, [PAS Report 600 Planning for Urban Heat Resilience](#)



**URBAN PLANNING:** e.g., ventilation corridors, land conservation, protection of urban tree canopy, cool pavements, shade structures



**URBAN GREENING:** e.g., park vegetation, open space, urban forests, street trees, green infrastructure, green roofs and walls



**INDOOR COOLING AND COOLING ACCESS**



**COOLING CENTERS, RESILIENCE HUBS, AND COMMUNITY SPACES FOR COOLING:** e.g., Be-a-buddy and community driven outreach and engagement



**OUTREACH, PUBLIC AWARENESS, AND EDUCATIONAL CAMPAIGNS**



# Building Community Capacities

- Regional planning and implementation networks
- Networks and communities of practice
- Neighbor-to-neighbor / Be-a-buddy programs
- Leveraging synergies with existing community resources and organizations

# Creating Cool Spaces

- Cooling centers and resilience hubs
- Community and public cooling spaces (pools, parks, libraries)
- Preserving greenspace and promoting tree equity
- Supporting staying cool at home



# Strengthening the Built Environment

- Ecosystem-based adaptation & green infrastructure
- Smart growth and complete streets
- Strengthened public transportation, walkable cities
- Reduce heat-trapping surfaces

# Communication and Outreach

- Leverage embedded and trusted communicators
- Multilingual and culturally appropriate materials are key
- Target communications to specific audiences
- Communicate early and targeted





### PERMEABLE PAVEMENT (VEGETATED)

PUBLIC PRIVATE

In lieu of traditional pavers, a roadbed composed of a mixture of stones, pavers, and vegetation allows water infiltration of nearly a quarter centimeter per minute. The water stored in the pavement/the soil beneath can evaporate and cool the pavement during summer. Permeable vegetated pavements can be used for footpaths, cycle paths, playgrounds, parking lots, tree pits etc.

KEEP IN MIND

- Porous pavement requires maintenance, typically annually
- Vegetation must be salt and water resilient
- Sensible to drought



### GREEN CORRIDORS

PUBLIC PRIVATE

Consist of larger collection of trees and / or other vegetation along streets or water features, which provides a green solution to the urban heat issues. Connecting green spaces as corridors can create a wind induced cooling effect by reducing the local ambient temperature, thus enhancing the overall cooling impact.

KEEP IN MIND

- Consider the trees/vegetation selection that are drought resistant/local/low water demand
- Green corridors enhance the biodiversity in a city, as the connected green spaces allow for

Examples:  
[Barcelona's](#) Green Corridor permea  
[Washington DC's](#) Permeable pavem

Urban cooling toolbox - Green infrastru



### DRINKING FOUNTAINS

PUBLIC PRIVATE

A public drinking fountain is a source of potable water for passers-by. It can be used to drink directly from or fill a water bottle. Placing drinking fountains across the city helps to keep citizens hydrated and make them less vulnerable during heat waves.

KEEP IN MIND

- Must be winterized
- Cleaning maintenance is necessary to ensure use and hygiene



Examples:  
[Berlin's](#) Drinking fountains  
[Hong Kong's](#) 'Water for Free' app  
[Melbourne's](#) Online map of drinking fountains

Urban cooling toolbox - Blue infrastru



### GROUND SHADING STRUCTURE

PUBLIC PRIVATE

Any structure that provides temporary or permanent shade from sunlight, thus improving thermal comfort. For example, shading structures can be used on squares, alongside walking and cycling routes, span narrow roads, or to cover street cafe seating. Temporary shades can prevent up to 98% of solar radiation directing onto people and urban surfaces.

KEEP IN MIND

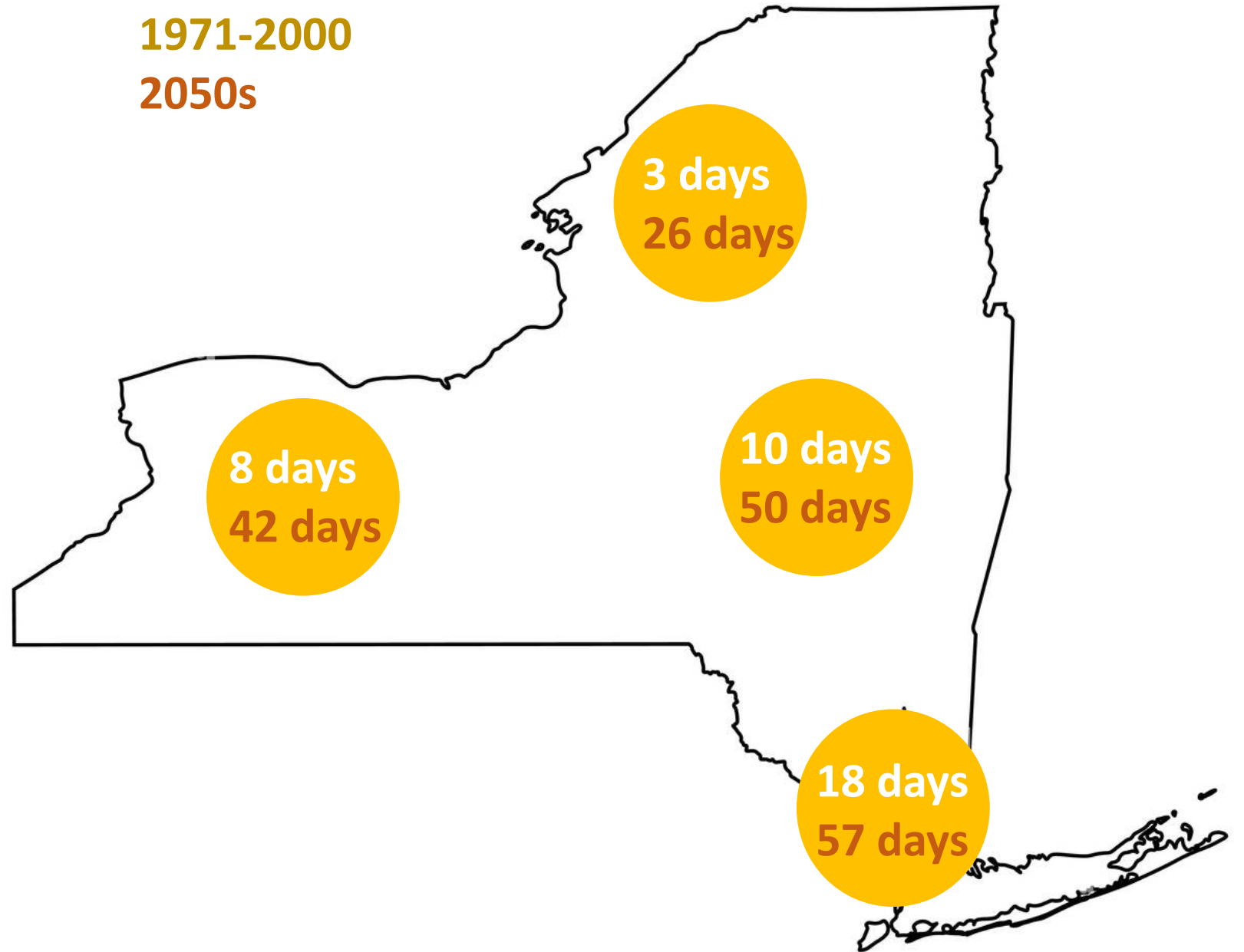
- Movable structures are better so sunlight is accessible in colder months.



Examples:  
[Tel Aviv's](#) Urban shade initiative  
[Tokyo](#) Fractal shading  
[Madrid's](#) Shading structures

Urban cooling toolbox - Grey infrastru

# PLAN FOR EXPECTED CONDITIONS THROUGHOUT THE PROJECT LIFESPAN



ClimAid Report (2014)  
High estimate projected days >90F

# TOOLS, RESOURCES

SUPPORT LOCAL  
ACTION & CAPACITY

## PROGRAMS (examples)

- DEC Climate Smart Communities Program
- DOH / BRACE grant program
- DHSES Hazard Mitigation Planning

## RESOURCES (examples)

- ClimAid Report, NYS Climate Impacts Assessment
- DOH heat health resources and information
- DEC Extreme Heat website

## TOOLS (examples)

- DOH Heat vulnerability index, county health profiles
- UHI mapping and related tools (forthcoming)
- EHAP planning tools (forthcoming)



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# Other tools (examples)

- [Heat Equity Mapper](#) (NIHHIS)
- [Heat and Health Tracker](#) (CDC)
- [Vibrant Cities Lab](#) (USFS)
- [Tree Equity Score](#) (American Forests)



# DEC Webinar Series

This webinar series is a resource to help communities better understand the impacts of extreme heat and learn about solutions for adapting and promoting partnerships to address extreme heat in New York State.

- Hosted by DEC, NYSERDA, the Expert Panel convened with SUNY Buffalo, and the EHAPWG
- TOPICS:
  - ✓ Extreme Heat and the Built Environment,
  - ✓ Extreme Heat, Health and Policy: Strategies Across New York's Many Landscapes
  - ✓ Showcasing Local Solutions and Partnerships
  - ✓ What Individuals and Local Governments Can Do Before and During a Heat Wave

**RECORDINGS ARE AVAILABLE ONLINE**



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# Connect with us

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