

# Urban Heat Island Study Results:

August 2023-August 2024



**City of Dallas**

**Parks, Trails, and  
Environment  
Committee  
September 3, 2024**

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Quality and Sustainability  
City of Dallas

# Presentation Overview



- Purpose of Study
- Recap of 2023 Study
- 2024 Study Overview
  - Campaign day
  - Technology and Methodology
- Next Steps of Planning and Implementation



# Purpose and Outcomes of Urban Heat Island Study



- Identify the hotspots in our city
- Look for equitable ways to implement cooling solutions in communities
- Take actions to reduce the health impacts of extreme heat, which often target the most vulnerable
- Tells us how to prepare for extreme heat



# Comprehensive Environmental Climate Action Plan



GOAL 6: Dallas protects and enhances its ecosystems, trees, and green spaces that in turn improve public health.

- Urban Heat Island Index
  - 75% reduction by 2050
- Canopy Cover Citywide
  - 40+% by 2050

GOAL 7: Promote environmental sustainability to improve public health and alleviate adverse environmental conditions

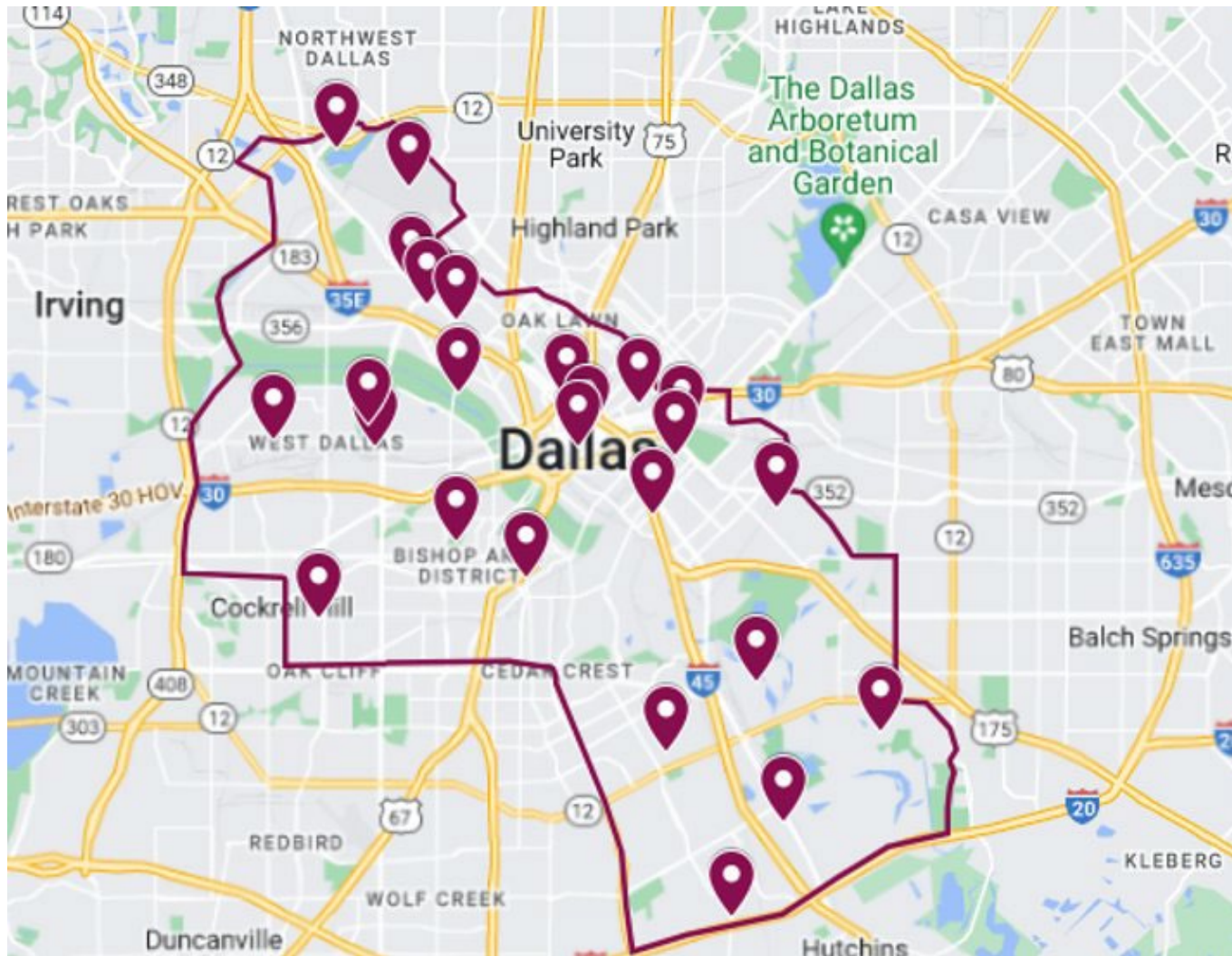
- Promote partnership efforts to implement green infrastructure projects in neighborhoods disproportionately vulnerable to the impacts of the urban heat island effect, poor water quality, and poor air quality

GOAL 8: All Dallas' Communities Breathe Clean Air

These efforts will also improve our air quality by decreasing ozone formation and reducing particulate matter.



# 2023 Study Area



100 square miles

70 volunteers

9 Routes

Points of interest included:

- City Hall
- Jefferies-Meyers Neighborhood
- Fish Trap Lake & West Dallas
- Joppa Community
- Dallas Zoo
- Klyde Warren Park
- Trammel Crow Park
- UT Southwestern Medical Center
- McCommas Bluff Landfill

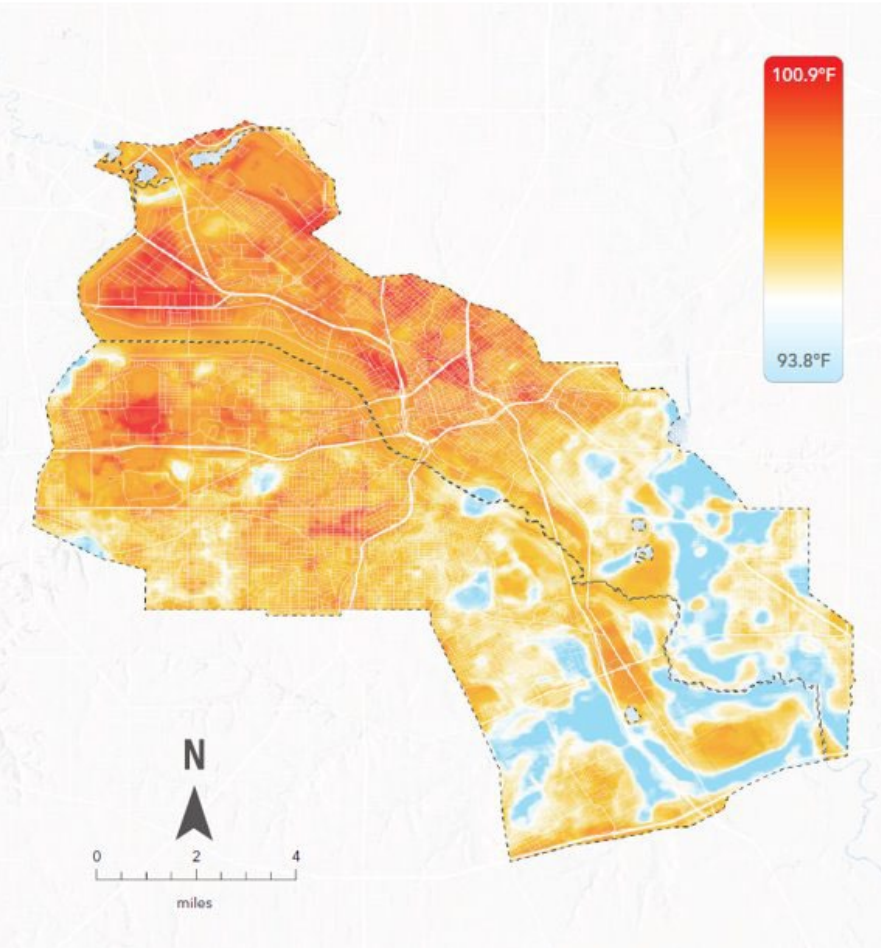


# Average Map 2023



## Average Area-Wide Model

The average model is produced by averaging together the morning, afternoon and evening models with equal weight.



- Areas that appear hottest were hot at more than one time
- Show full daytime exposure



# Hottest Areas 2023

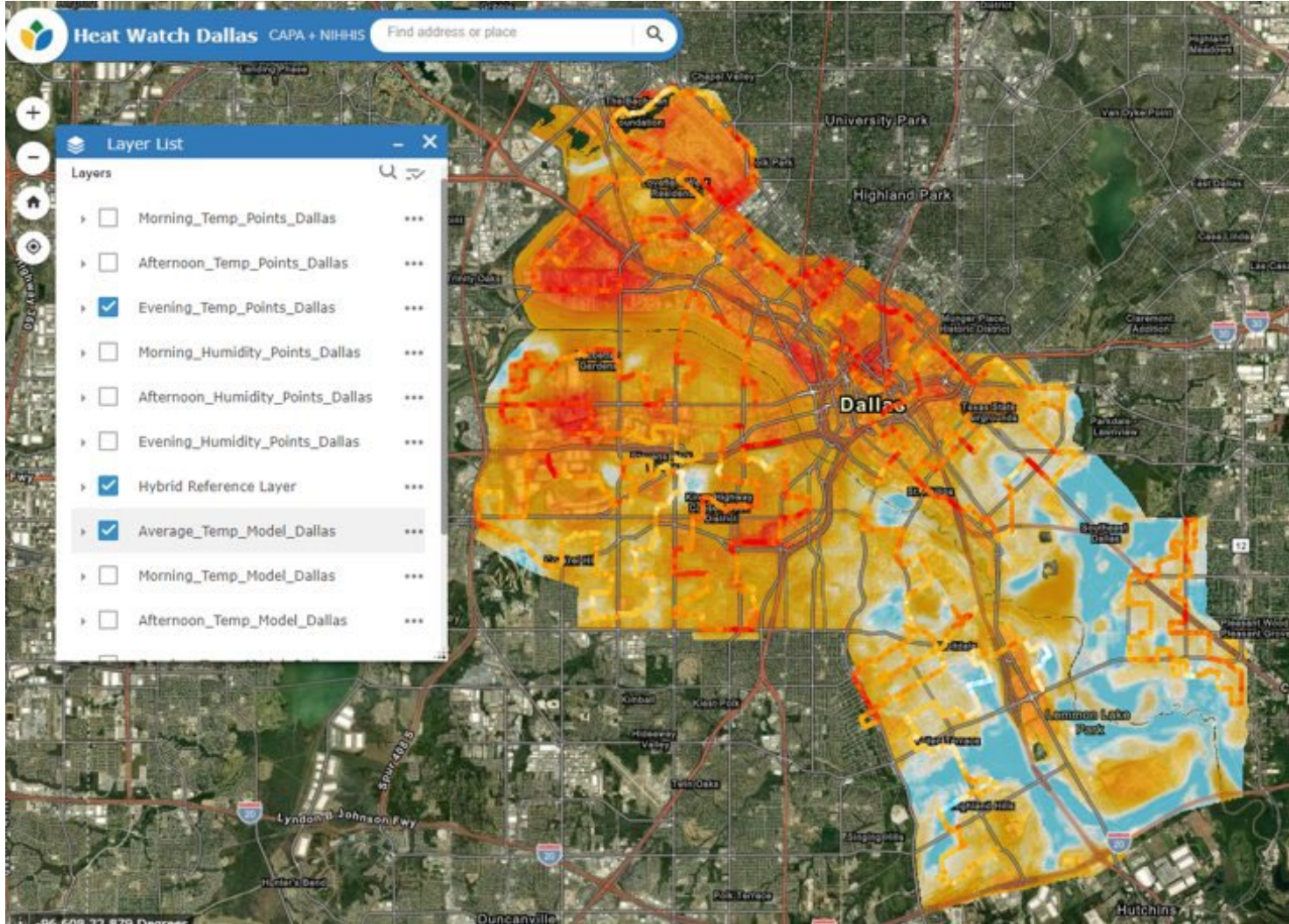


- From the Heat Island study, hottest areas included
    - Love Field – Districts 6 and 2
    - Medical District- District 2 \*
    - Uptown- District 14
    - Oak Lawn- District 14
    - Downtown – District 14
    - Deep Ellum -District 2
    - Design District -District 6
    - West Dallas- District 6 \*
    - Bishop Arts- District 1 \*
    - Stemmons/Market Center - District 6
  - Industrial-Commercial areas with homogenous building layout concentrate heat throughout the day
  - Fully shaded residential neighborhoods reduce exposure to high temperatures
  - Large natural areas help keep the region cool throughout the day, including the Great Trinity Forest
- \* Indicate areas where there are communities with environmental justice concerns

Accuracy Assessment*	
Model Period	Adjusted R-Squared
6 - 7 am	0.99
3 - 4 pm	0.94
7 - 8 pm	0.97



# Interactive Map 2023 Available

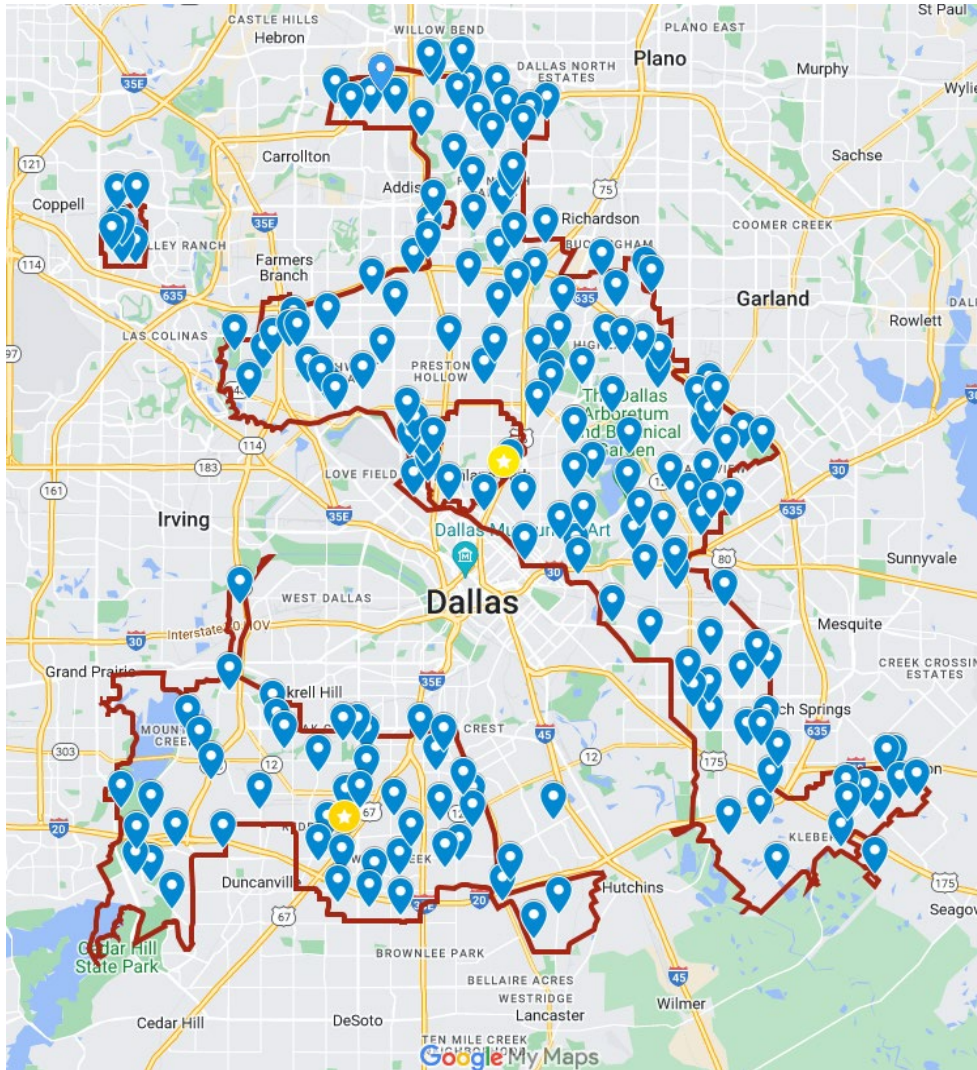


- Link available at: [DallasClimateAction.com/UrbanHeatIslandStudy](https://DallasClimateAction.com/UrbanHeatIslandStudy)
- Average, Morning, Mid-Day, and Evening maps available





# 2024 Study Area



- 245 square miles
- 100 volunteers
- 21 Routes, Points of interest included:
  - Kiest Park
  - Dallas Executive Airport
  - Dallas Arboretum
  - Cypress Waters
  - Bahama Beach Water Park
  - UNT Dallas
  - Seagoville High School
  - Pleasant Grove
  - Flagpole Hill Park
  - Audelia Rd. Library



# Campaign Day



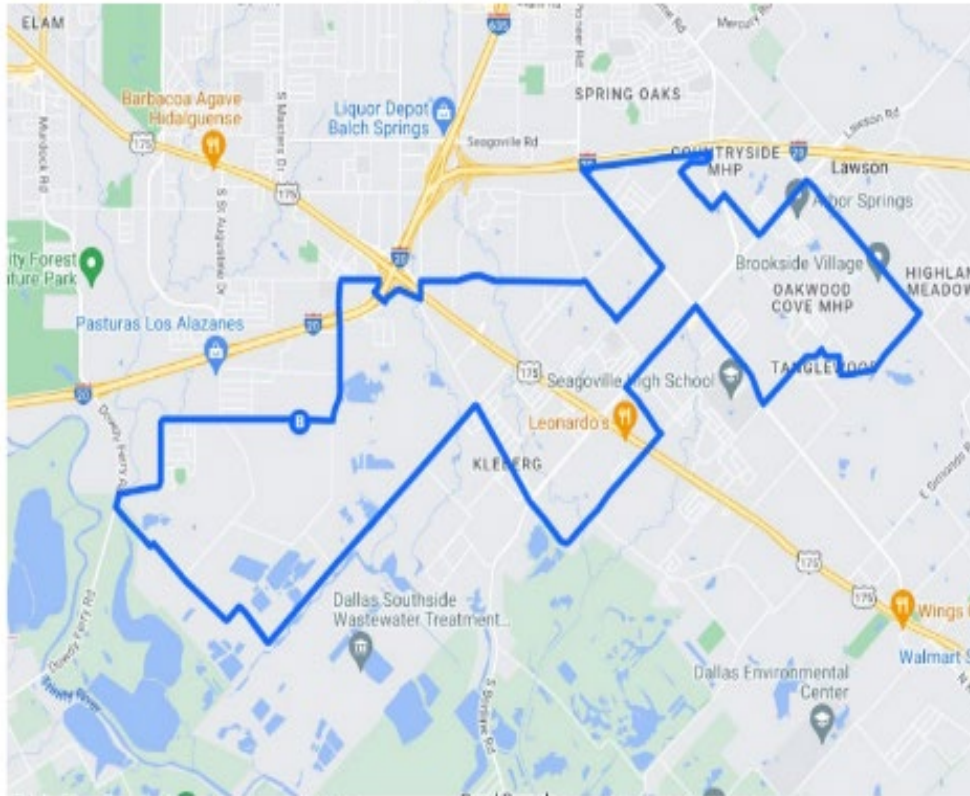
- Volunteers placed sensor on car window and drove predesigned routes three times per day (6-7am, 3-4pm, and 7-8pm)
- What was measured every second during the hour:
  - Ambient Air temperature
  - Humidity
  - Time
  - Location, by GPS coordinates
  - Heat index
    - Approximates the heat felt when the presence of humidity is felt in combination with temperature. Measurement calculation advised by the National Weather Service.



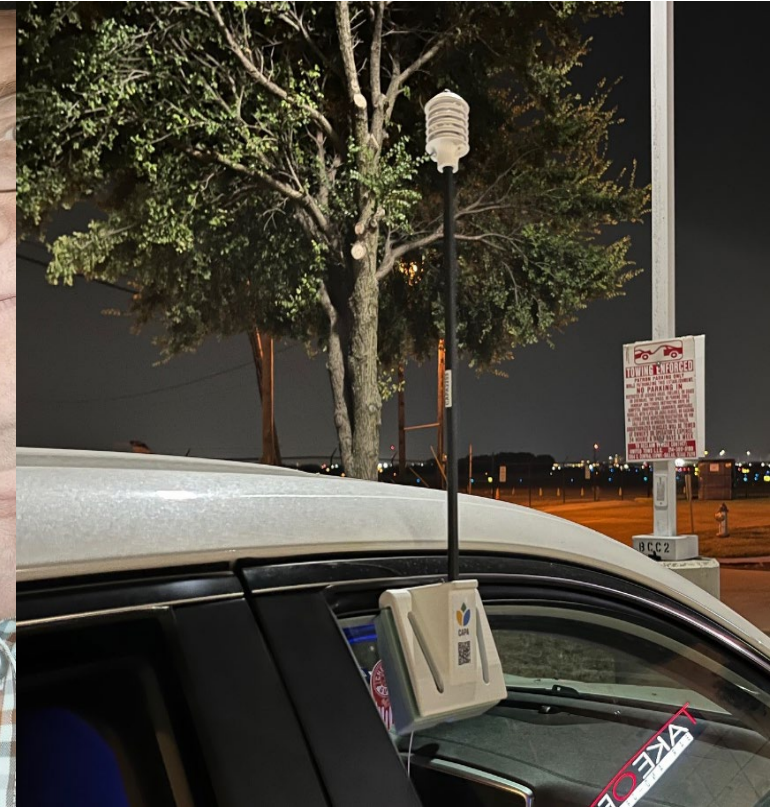
# Campaign Day



Route 12: Drive 23 mi, 57 minutes



Navigation Link: <https://bikegpx.com/routes/68e8bbe9>



Stephanie and Russ Frizzell



# Partnership with Texas Trees Foundation and Sierra Club Dallas



- Texas Trees Foundation
  - 30 volunteers took surface temperature readings
  - Data collected at 4 locations across the same 3 times (6-7 AM, 3-4 PM, and 7-8 PM).
    - Southwestern Medical District
    - White Rock Lake
    - Fair Park
    - Oakland Cemetery
  - Volunteers were equipped with an infrared digital thermometer
- Sierra Club Dallas
  - Donated \$10 virtual gift cards to all volunteers (except city staff)



# Next Steps of Planning and Implementation



- 2024 Data will be available in about 12 weeks
- Environmental Justice Efforts
- Weatherization to increase efficiency of homes
- Smart Surfaces Coalition
- Implement tree planting strategies
  - Texas Trees Foundation [Tree Equity Planting Map](#)
- Develop heat action plans
  - Identify cooling relief shelters and high-risk groups
  - Develop response strategies
  - Public awareness and notification
  - Extreme Heat protocols
  - Increase resilience of built environment
  - Nature based solutions
- Jurisdictional Scan planned for 2024
  - Summary of plans, codes, policies and other documents relevant to heat-related preparedness, mitigation, or adaptation
  - Summarize gaps and opportunities for the future based on results of the scan.





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