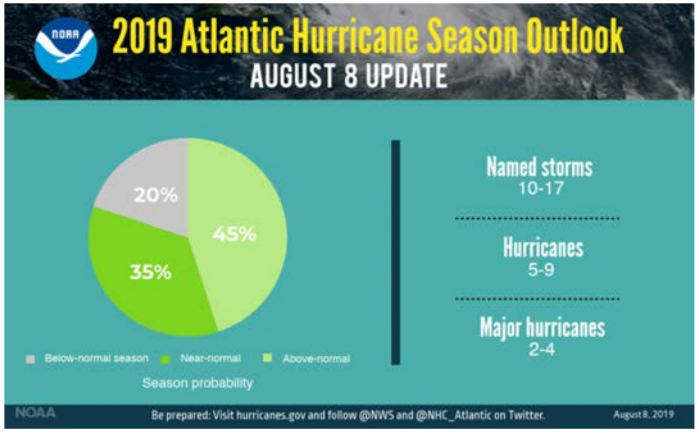
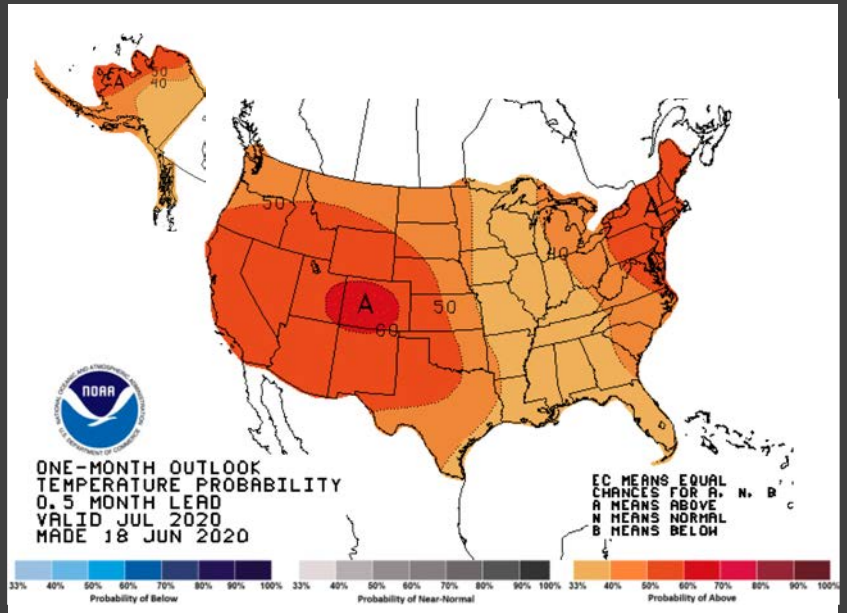
NIHHIS-CAPA 2020 Urban Heat Island Mapping Campaigns

- Hunter Jones – Climate and Health Project Manager, NOAA Climate Program Office (UCAR Affiliate)
- Juli Trtanj, Vivek Shandas, David Herring, Thea Kindschuh, Joey Williams, Tom DiLiberto



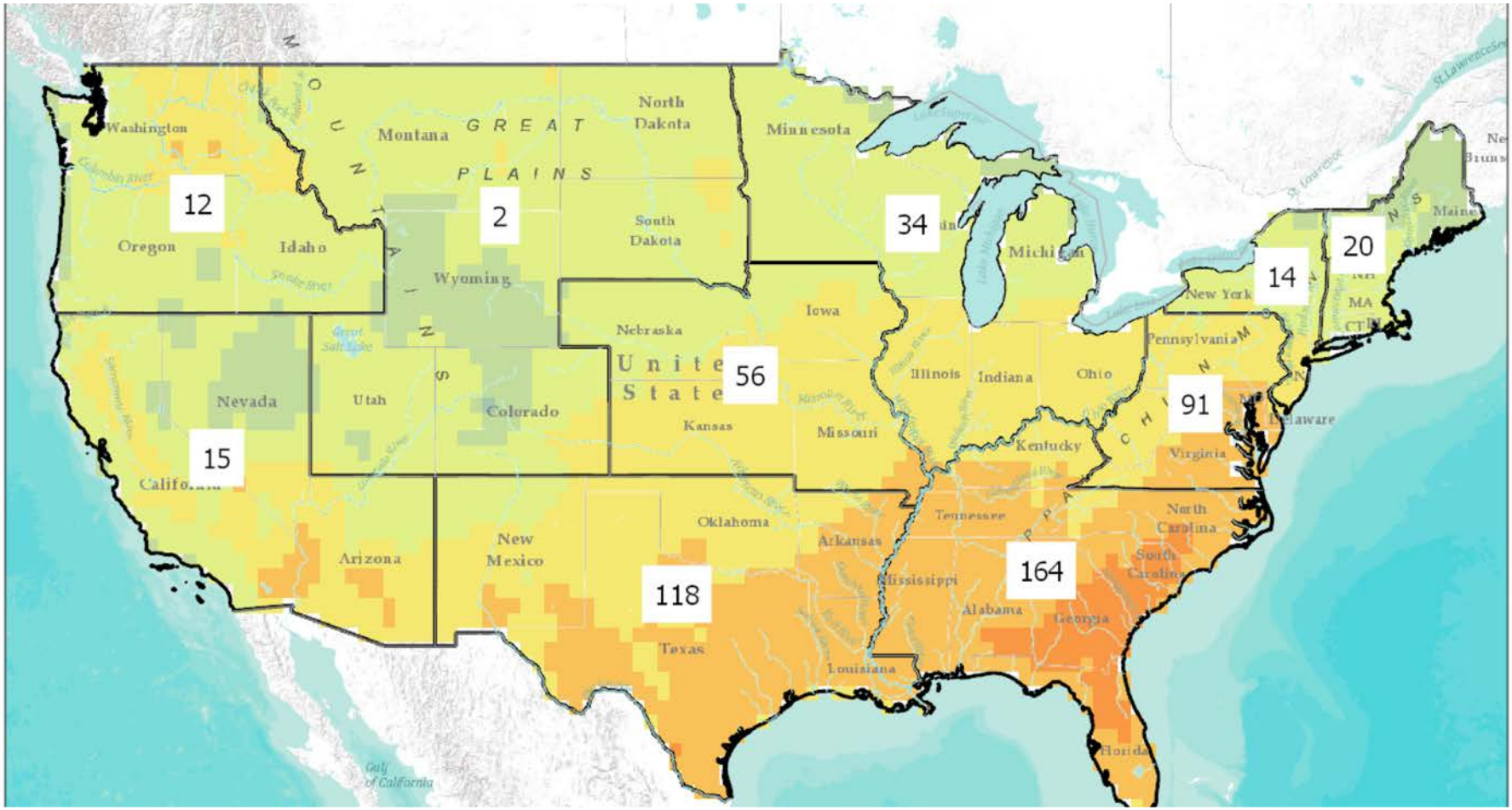


CHMO

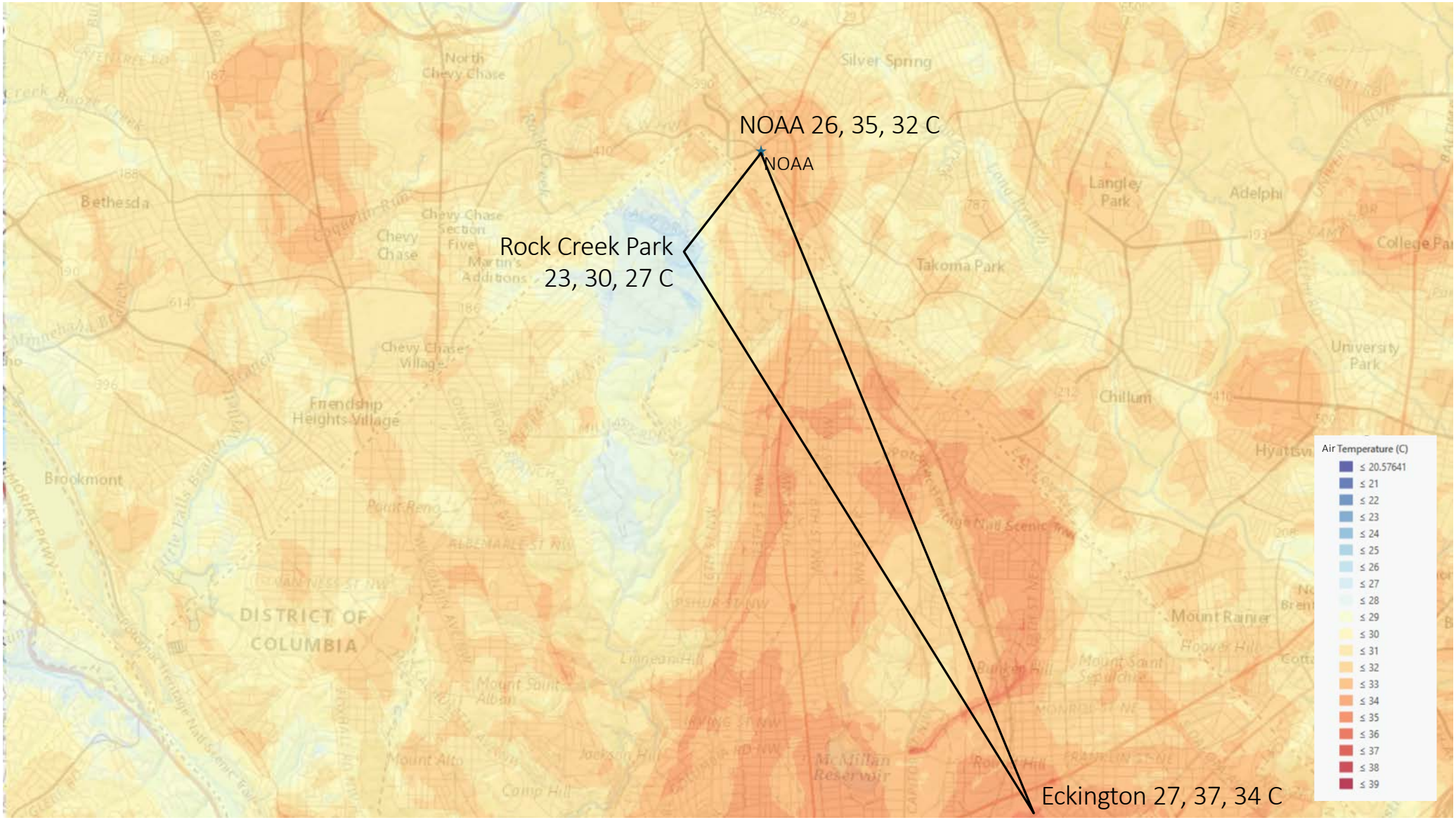
An activity of the USGCRP

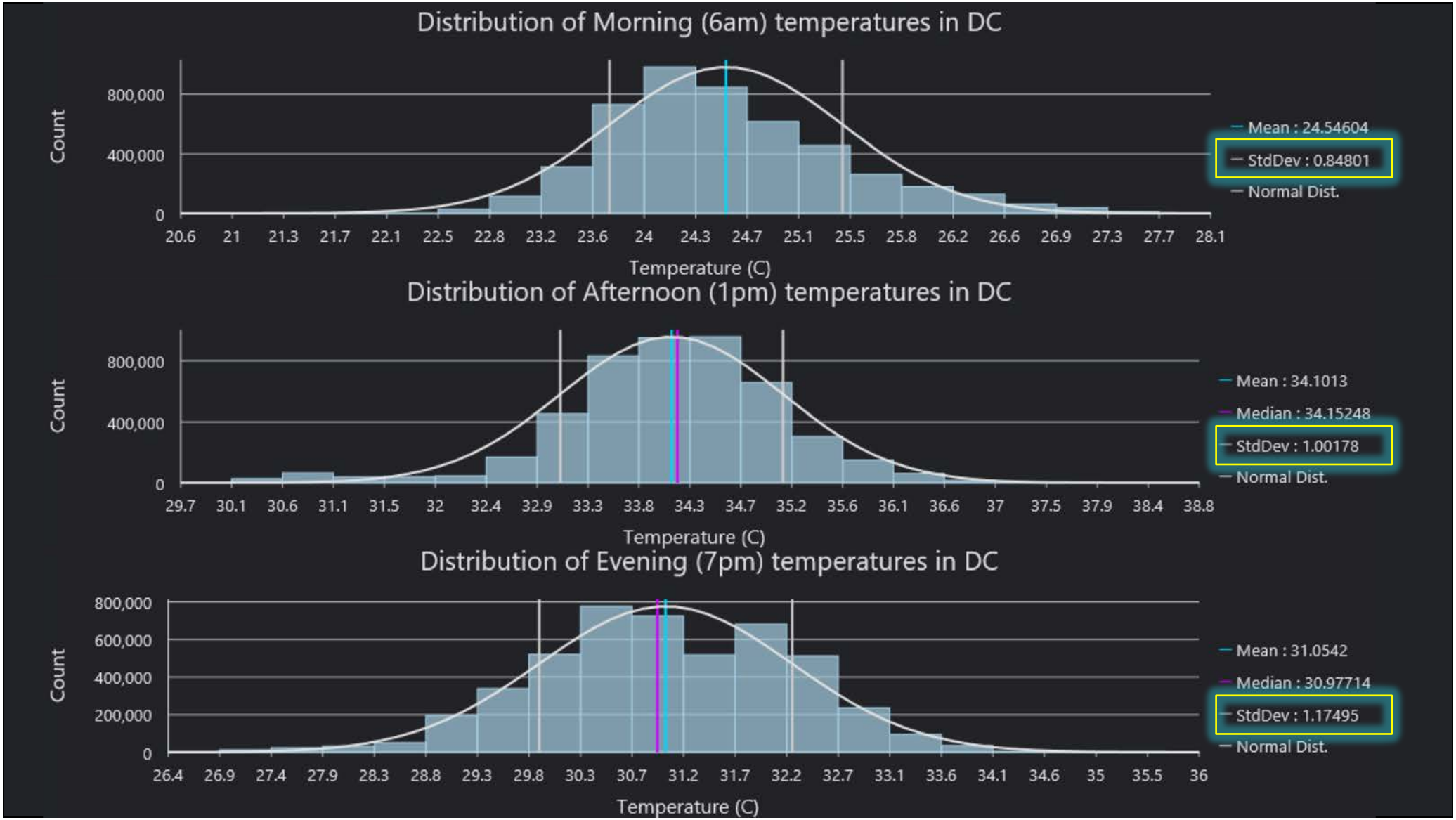
The Climate and Health Monitor and Outlook was created to consolidate, develop, and provide a suite of useful climate-based health-relevant information to decision makers on a seasonal-sub-seasonal (S2S) time scale with the intent that earlier actions can be taken to reduce overall climate-sensitive disease risks that have the potential to impact US persons at home and abroad.

NIHHIS Monitor: Combines CDC Syndromic Surveillance + Weather Data

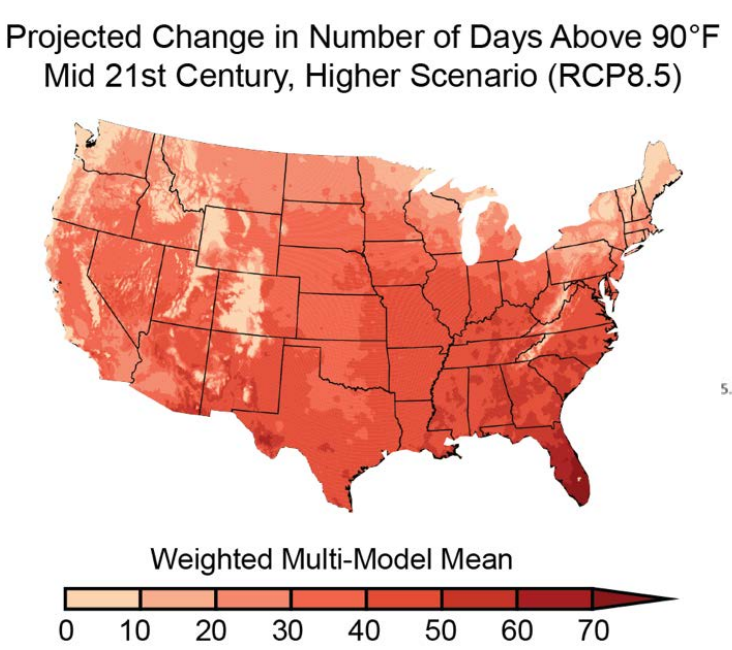


Number of ED visits for Heat Related Illness per 100,000 visits


NOAA 26, 35, 32 C
NOAA
Rock Creek Park
23, 30, 27 C
Eckington 27, 37, 34 C
Air Temperature (C)
≤ 20.57641
≤ 21
≤ 22
≤ 23
≤ 24
≤ 25
≤ 26
≤ 27
≤ 28
≤ 29
≤ 30
≤ 31
≤ 32
≤ 33
≤ 34
≤ 35
≤ 36
≤ 37
≤ 38
≤ 39
Bethesda
Chevy Chase
Silver Spring
Takoma Park
Langley Park
Adelphi
Chillum
University Park
Friendship Heights Village
Brookmont
DISTRICT OF COLUMBIA
Mount Rainier

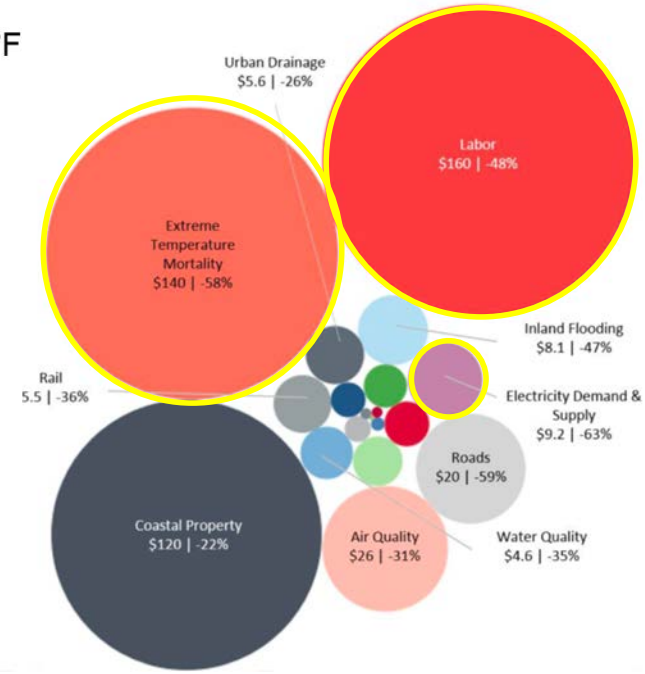

Distribution of Morning (6am) temperatures in DC
Count
800,000
400,000
0
20.6 21 21.3 21.7 22.1 22.5 22.8 23.2 23.6 24 24.3 24.7 25.1 25.5 25.8 26.2 26.6 26.9 27.3 27.7 28.1
Temperature (C)
Mean : 24.54604
StdDev : 0.84801
Normal Dist.
Distribution of Afternoon (1pm) temperatures in DC
Count
800,000
400,000
0
29.7 30.1 30.6 31.1 31.5 32 32.4 32.9 33.3 33.8 34.3 34.7 35.2 35.6 36.1 36.6 37 37.5 37.9 38.4 38.8
Temperature (C)
Mean : 34.1013
Median : 34.15248
StdDev : 1.00178
Normal Dist.
Distribution of Evening (7pm) temperatures in DC
Count
800,000
600,000
400,000
200,000
0
26.4 26.9 27.4 27.9 28.3 28.8 29.3 29.8 30.3 30.7 31.2 31.7 32.2 32.7 33.1 33.6 34.1 34.6 35 35.5 36
Temperature (C)
Mean : 31.0542
Median : 30.97714
StdDev : 1.17495
Normal Dist.

It's hot. It's getting hotter. Extreme heat kills.



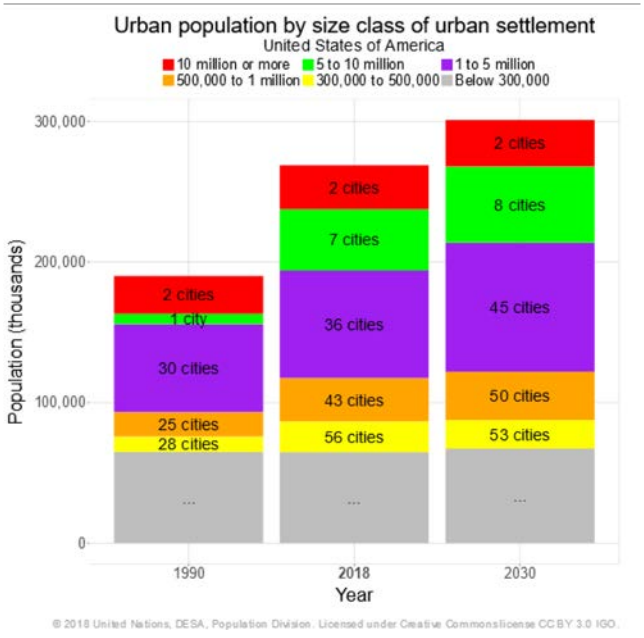
NCA4 CSSR

~**20–30 more days** per year with a **maximum over 90°F** (32°C) in most areas by mid-century under RCP8.5



EPA CIRA II

U.S net average increase of **9,300 premature deaths** per year under RCP8.5 by 2090 in 49 modeled cities. **$140bn** annual in **economic damages**



UNDP

by **2050 68%** of people will live in **cities,** up from about 55% at present

nihhis.cpo.noaa.gov

The National Integrated Heat Health Information System (NIHHIS)

- NOAA and CDC launched the National Integrated Heat Health Information System (NIHHIS) in June of 2015 to address heat risk across timescales.
- NIHHIS quickly grew to include representation from several agencies (right) in an **interagency working group**. The group launched the NIHHIS portal and began harmonizing information and guidance.
- NIHHIS has also launched **local pilots** to understand local decision-making context and information needs, and to improve the transition of research to action.

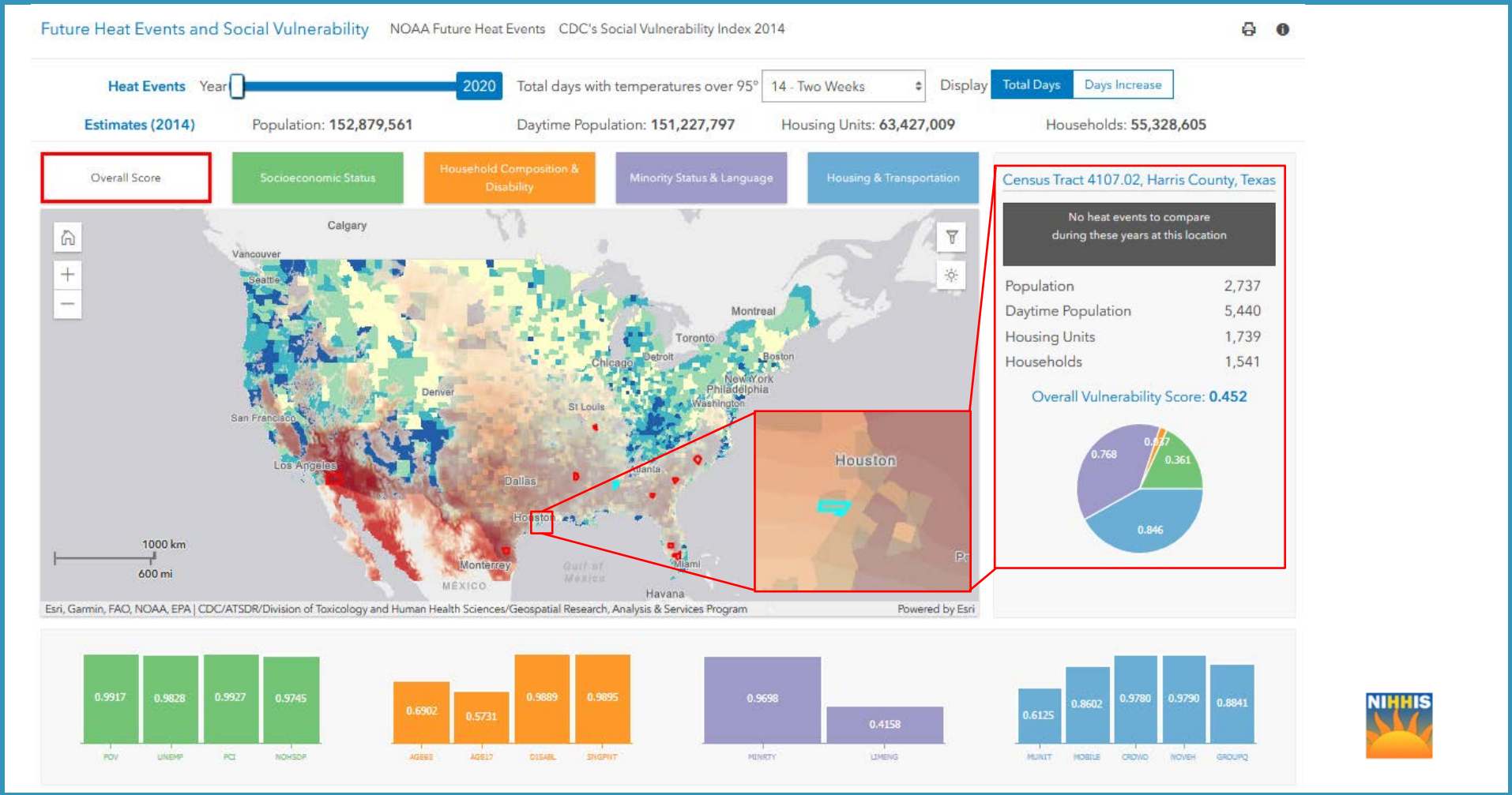
Ongoing activities include:

- Prototyping new integrated climate-health products,
- 'Decision calendar' exercises to understand multi-disciplinary needs in the Northeast,
- National projects to spread awareness and create useful and usable data as Urban Heat Island campaigns.

NIHHIS operates according to a common framework of core questions under the following thematic areas: capacity & partnership, heat-health parameters & outcomes, data and forecast products, communication, intervention effectiveness

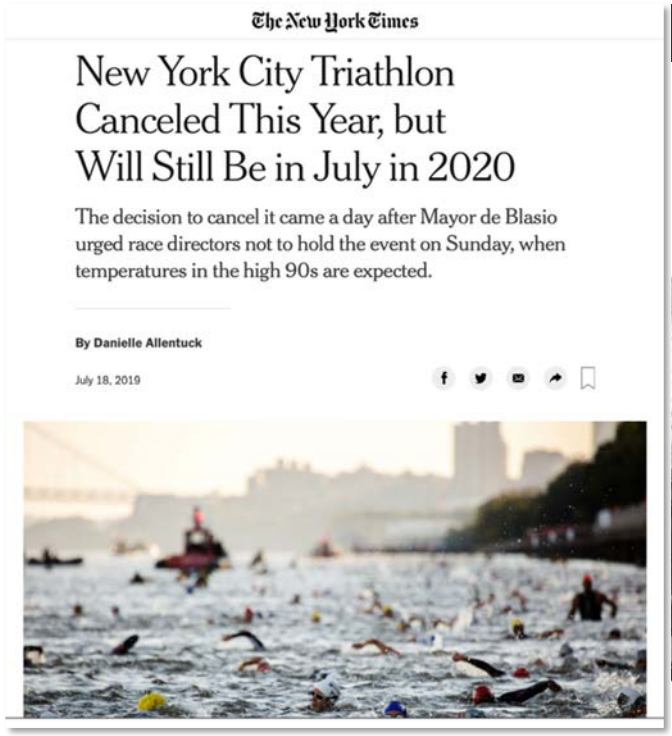
NIHHIS will facilitate an integrated approach to providing a suite of decision support services to reduce heat related illness and death

NIHHIS-Esri Extreme Heat Vulnerability Map Tool



combines CDC Social Vulnerability Index with Heat Projections at census tract scale

Cities are need better information on urban heat in order to target actions.



The New York Times

New York City Triathlon Canceled This Year, but Will Still Be in July in 2020

The decision to cancel it came a day after Mayor de Blasio urged race directors not to hold the event on Sunday, when temperatures in the high 90s are expected.

By Danielle Allentuck

July 18, 2019

The Guardian

Re-greening: can Louisville plant its way out of a heat emergency?

Josh Wood • Last modified on Mon 3 Feb 2020 07.45 EST

The Kentucky city is the fastest-warming urban heat island in the US – and as its temperature has risen, its tree cover has plummeted

A 2015 study found that Louisville lost 54,000 trees a year between 2004 and 2012. Photograph: Roya Oshrieh/Alamy

CITYLAB

The Problem With 'Cool Pavements': They Make People Hot

A tool to help solve the problem of urban heat islands could have an unwelcome side effect, new research in L.A. finds.

Workers apply CoolSeal to a street in Pacoima in June. Los Angeles Bureau of Street Services

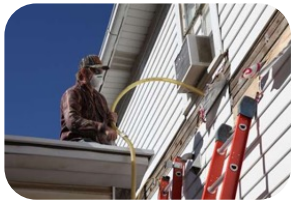
Trees and Vegetation

Green Roofs

Cool Roofs

Cool Pavements

Smart Growth



Weatherization

Green Building Programs and Policies

Sun Shades

Mobile Cooling Vans

Spray Parks

Communication and Education

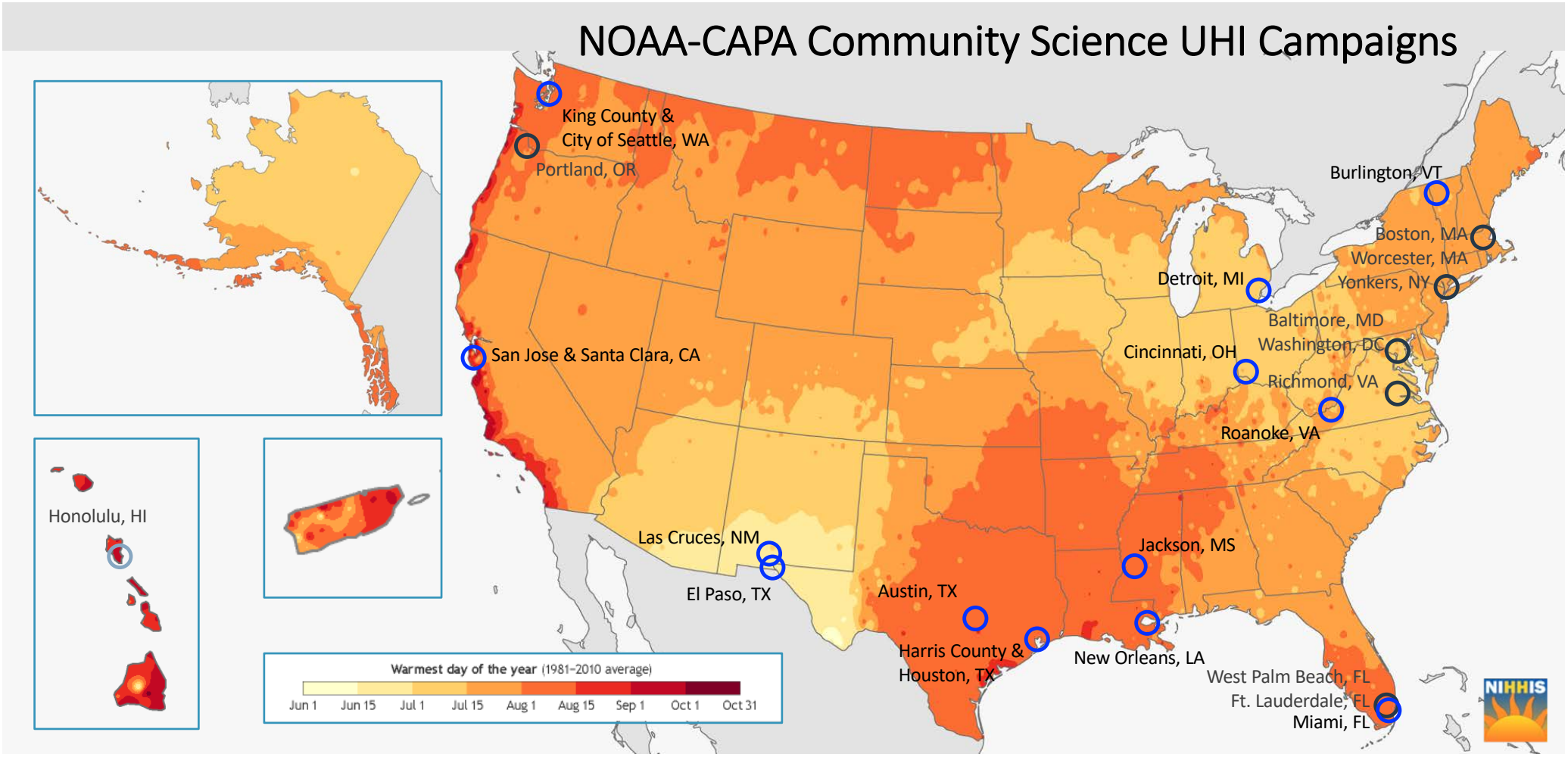
Energy Assistance Programs

Enabling Urban Solutions with Better Urban Heat Island Information

Many of the existing actions and interventions used to reduce the health impacts of extreme heat can be informed by detailed urban heat island information. They can be targeted to the hottest areas in the short-run, and cities can be better designed to prevent UHI's from developing in the long-run.

NIHHIS nihhis.cpo.noaa.gov

NOAA-CAPA Community Science UHI Campaigns



climate.gov

This map shows the locations of the previous Urban Heat Island mapping campaigns superimposed upon a map of the climatological (19810-2010) average hottest day of the year. Historical climate information as well as weather and climate predictions from NOAA are used to plan the campaigns in cities across the U.S.

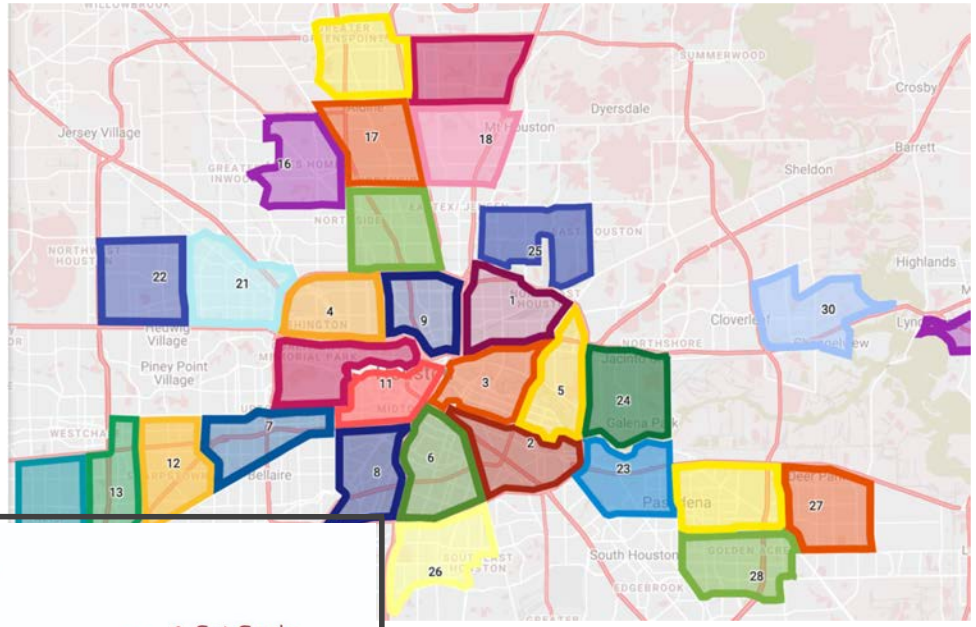
nihhis.cpo.noaa.gov

HEAT BEAT
newsletter

Timely information for people and communities who are working to address local concerns about heat health.

NOAA-funded 2020 Heat Campaign Cities Announced

Through a peer-review process, NOAA's Climate Program Office (CPO) selected thirteen community partners in cities across the U.S. to receive funding support to perform a community science urban



Urban Heat Island Data Table Mock-up

Needs to repeat for each city

	D1	D2	D3	D4	D5	D6	D7
Expected Temp	78	84	90	92	94	88	80
Daytime PoP	30	20	15	10	5	60	25
Avg. Sky Cover	55	50	40	20	45	80	60
Probability 90°F HIGH	0	8	55	65	85	35	0
Probability 95°F HIGH	0	0	10	25	40	0	0
Probability 100°F HIGH	0	0	0	0	5	0	0

Can we add return interval or avg. per year for each city for context?

NDFD source

Thresholds needed! Visually easier to interpret

WPC source

Chiclet Chart Style

Marginally favorable

Favorable

Very favorable

NIHHIS

nihhis.cpo.noaa.gov

CAPA Heat Watch

Organizer Timeline

1. Set Goals

Determine the timing of your Heat Watch campaign and set up your team with partner organizations and a lead campaign "organizer".

2. Establish

Get to know the Heat Watch process, begin volunteer engagement with provided outreach materials, and schedule a kickoff meeting with the CAPA team.

3. Prepare

Ensure volunteers are ready for their important role as data collectors with a training session, knowledge check, and route assignment.

4. Activate

Finish preparatory steps by finalizing a campaign date, notifying volunteers and distributing CAPA-provided equipment.

5. Execute

Conduct a successful campaign, mapping the distribution of heat across your city at morning, afternoon and evening. Participants can connect via social media to share their

HARC

Harris County Public Health
Building a Healthy Community

The Nature Conservancy

RESILIENT HOUSTON

HOUSTON HARRIS HEAT ACTION TEAM (H3AT)

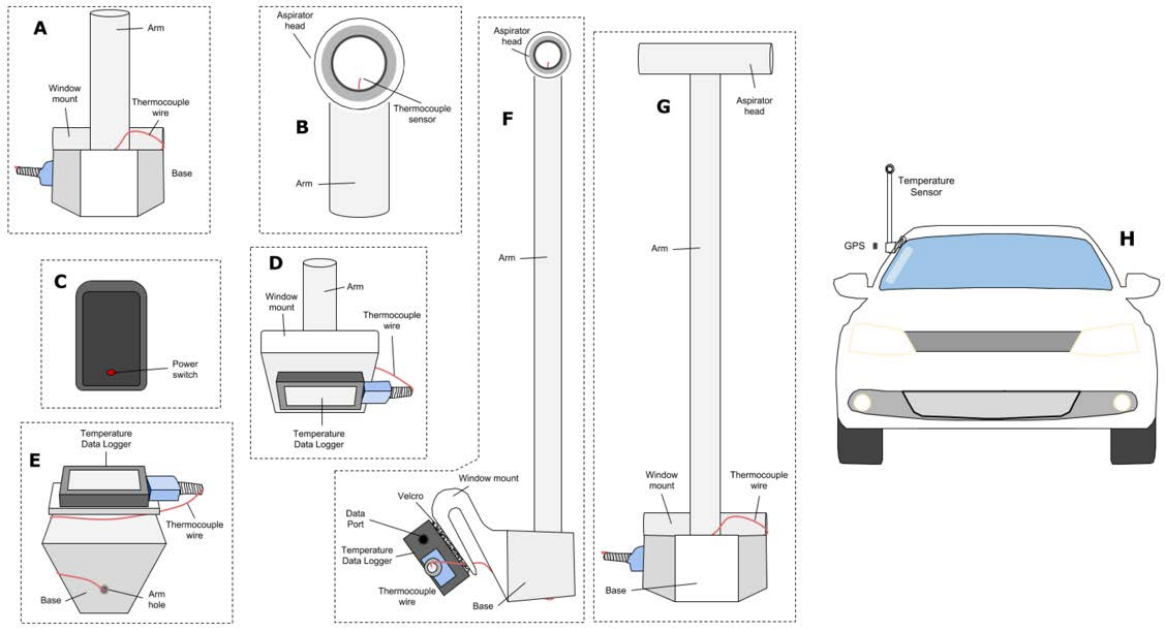


Figure 2 Rendering of Sensor Setup. (A) Front of base; (B) Aspirator detail; (C) GPS unit; (D) Back of base; (E) Bottom of base; (F) Profile of device; (G) Front of device; (H) Approximate scale of device and GPS unit (GPS unit kept inside of vehicle).

From Voelkel and Shandas 2017; adapted with permission from Makido et al., 2016.

The Field Campaign

The day prior:

Volunteers collect the gear and receive training on how to install it and operate it. They also get a science lesson on UHI.

The day of:

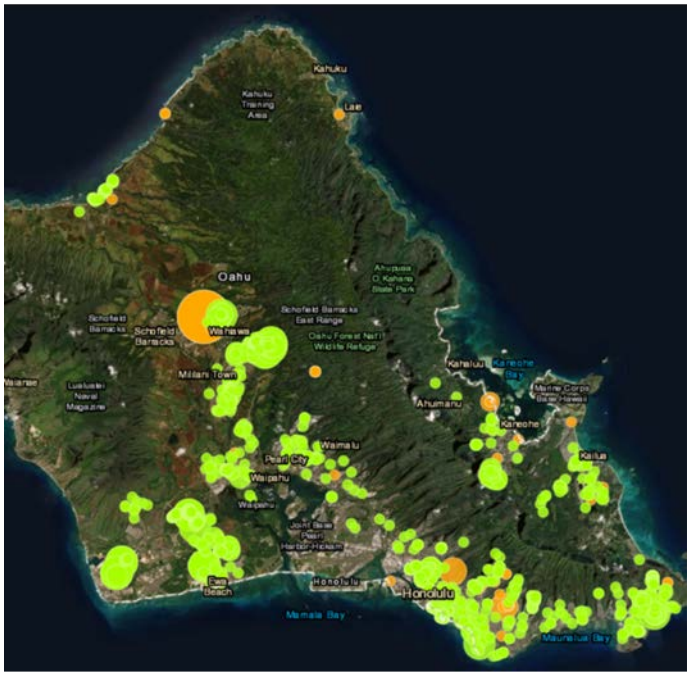
Volunteers run their assigned transect routes in the morning, afternoon, and evening.

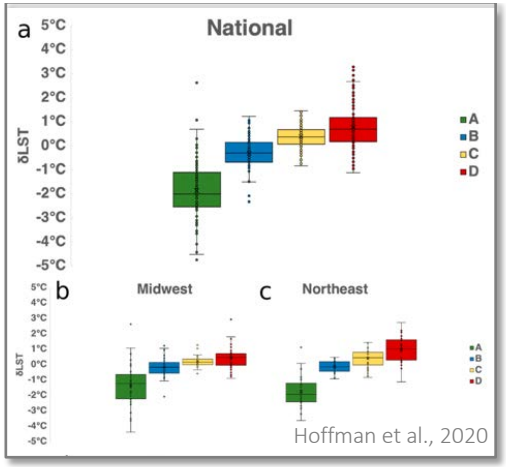
The sensors log the temperature and humidity every second, along with GPS location.

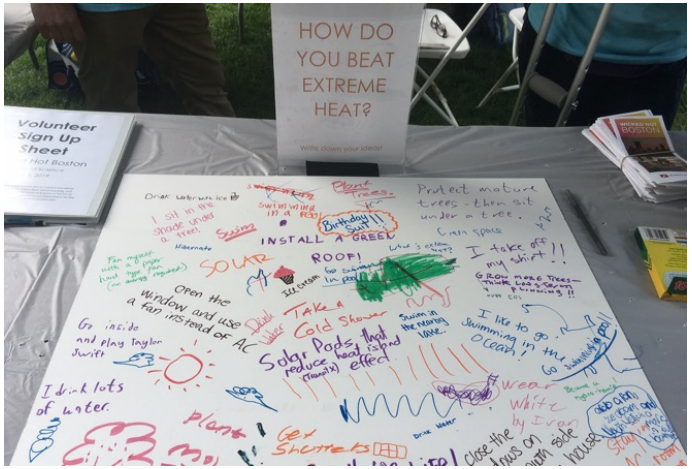
Later this year:

The CAPA Strategies team combines the transects & landcover data from Landsat via a machine learning (random forest) process to generate heat intensity surfaces.

Voelkel, J.; Shandas, V. Towards Systematic Prediction of Urban Heat Islands: Grounding Measurements, Assessing Modeling Techniques. Climate ***2017****, 5, 41.*







Outcomes

Clockwise from upper-left:

- 10,000 Trees Honolulu
- Publication: The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas
- Throwing Shade in RVA @ the Richmond Science Museum
- Wicked Hot Boston

GLOBAL HEAT HEALTH INFORMATION NETWORK

www.ghhin.org/learning-center/masterclasses

Masterclass:

Economic valuation of heat-health impacts and interventions

30 June 2020, 17:00-18:30 CEST

Speakers: Shubhayu Saha, US Centers for Disease Control and Prevention;
Vijay Limaye, Natural Resources Defense Council
Moderator: Roop Singh, Red Cross Red Crescent Climate Centre

www.ghhin.org/learning-center/masterclasses

Heat Health Masterclasses

2 June 2020

Setting operational thresholds for Heat Early Warning Systems

16 June 2020

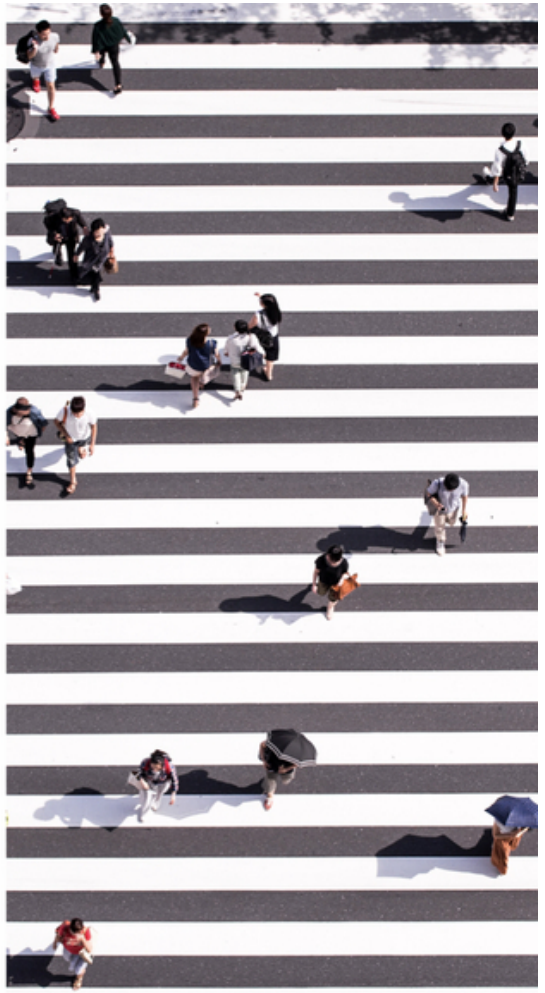
Innovating in urban planning and governance for heat health

30 June 2020

Economic valuation of heat-health impacts and interventions

21 July 2020

Developing an effective Heat Health Action Plan (HHAP) for your city



GLOBAL HEAT HEALTH INFORMATION NETWORK

#HEATHEALTH
www.ghhin.org