About EESI

- Non-partisan Educational Resources for Policymakers
  A bipartisan Congressional caucus founded EESI in 1984 to provide non-partisan information on environmental, energy, and climate policies

- Direct Assistance for Equitable and Inclusive Financing Program
  In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop “on-bill financing” programs

- Commitment to Diversity, Equity, Inclusion, and Justice
  We recognize that systemic barriers impede fair environmental, energy, and climate policies and limit the full participation of Black, Indigenous, people of color, and legacy and frontline communities in decision-making

- Sustainable Solutions
  Our mission is to advance science-based solutions for climate change, energy, and environmental challenges in order to achieve our vision of a sustainable, resilient, and equitable world.
Policymaker Education

Briefings and Webcasts
Live, in-person and online public briefings, archived webcasts, and written summaries

Climate Change Solutions
Bi-weekly newsletter with everything policymakers and concerned citizens need to know, including a legislation and hearings tracker

Fact Sheets and Issue Briefs
Timely, objective coverage of environmental, clean energy, and climate change topics

Social Media (@EESIOnline)
Active engagement on Twitter, Facebook, LinkedIn, and YouTube
Upcoming Briefings & Series

Living with Climate Change
- Polar Vortex – April 13
- Sea Level Rise – May 18
- Wildfires – June 13
- Extreme Heat – June 24

Scaling Up Innovation to Drive Down Emissions
- Green Hydrogen – April 27
- Direct Air Capture – May 25
- Electric Vehicle Charging – June 02
- Offshore Wind Energy – June 29
Planning for Urban Heat Resilience

Ladd Keith, Ph.D.
Assistant Professor of Planning
Chair of Sustainable Built Environments

EESI Living with Climate Change: Extreme Heat
June 24, 2022

ladd@arizona.edu
@LaddKeith
Planning for Urban Heat Resilience
Ladd Keith & Sara Meerow

Chapter 1 | Urban Heat: A Growing Risk
Chapter 2 | Understanding the Complexities of Urban Heat
Chapter 3 | Equity and Urban Heat
Chapter 4 | Urban Heat Resilience Planning Framework
Chapter 5 | Heat Mitigation Strategies
Chapter 6 | Heat Management Strategies
Chapter 7 | Planning Tools for Urban Heat Resilience
Chapter 8 | Advancing Urban Heat Resilience
Planning for Urban Heat Resilience

Urban heat: A growing risk

Continued rise in average temperatures and increases in the intensity, duration, and frequency of extreme heat events

- Climate change
- Urban heat island (UHI) effect
Planning for Urban Heat Resilience

Urban heat: A growing risk

- Social
  - Public health
  - Quality of life
- Economic
  - Labor
  - Economic productivity
- Environmental
  - Landscapes and ecology
- Infrastructure
  - Energy and water usage

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Planning for Urban Heat Resilience

Understanding the complexities of urban heat

(Keith & Meerow, 2022)
Equity and urban heat

- Inequitable distribution of heat severity
  - Legacy of racist land use practices (redlining)
  - Continued community disinvestment
- Systematic inequities
  - Housing and indoor cooling
  - Workplace and school environments
  - Transportation
  - Healthcare
  - Exclusion from decision-making
Planning for Urban Heat Resilience

Urban heat resilience planning framework

“Proactively mitigating and managing urban heat across the many systems and sectors it affects.”

(Keith & Meerow, 2022)
Planning for Urban Heat Resilience

Heat resilience strategies

• Heat mitigation
  • Land use
  • Urban design
  • Urban greening
  • Waste heat

• Heat management
  • Energy systems
  • Personal exposure
  • Public health
  • Emergency preparedness

(Keith & Meerow, 2022)
Planning for Urban Heat Resilience

Planning tools for heat mitigation

“Network of plans”

- Community visioning and engagement
- Plans and policies
  - Comprehensive plan
  - Hazard mitigation plan
  - Climate action plan
- Regulations and project review
  - Zoning and land use regulations
  - Streetscape design guidelines
  - Building codes
  - HOA regulations and CC&Rs
- Public investments
  - Parks, open space, and connections
  - Flood management infrastructure
  - Transportation and transit infrastructure
- Public buildings

(Keith & Meerow, 2022)
Heat governance

“The actors, strategies, processes, and institutions that guide decision-making for mitigating and managing heat as a hazard.”

Six guiding principles

- Advance heat equity
- Mitigate heat
- Manage heat
- Develop metrics
- Coordinate initiatives
- Build heat institutions

@LaddKeith
Thank You

Ladd Keith, Ph.D.
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Planning for Urban Heat Resilience
tinyurl.com/urbanheatresilience

Deploy heat officers, policies and metrics
tinyurl.com/heatgovernance

Planning for Urban Heat Resilience was supported by the U.S. NOAA Climate Program Office’s Extreme Heat Risk Initiative, Cooperative Agreement NA21OAR4310148.
EXTREME HEAT & PUBLIC HEALTH

SONAL JESSEL, MPH
DIRECTOR OF POLICY
HEAT WAVES ARE INCREASING IN
SEVERITY
FREQUENCY
DURATION
& WE HAVE THE URBAN HEAT ISLAND EFFECT

"THE ANNUAL MEAN AIR TEMPERATURE OF A CITY WITH 1 MILLION PEOPLE OR MORE CAN BE 1.8–5.4°F (1–3°C) WARMER THAN ITS SURROUNDINGS" (EPA)
Weather Fatalities 2019

- Weather Fatalities for 2019
- 10-Year Average (2010-2019)
- 30-Year Average (1990-2019)

Flood: 92
Lightning: 20
Tornado: 41
Hurricane: 42
Heat: 68
Winter: 138
Cold: 63
Wind: 0
Rip Currents: 5

This graph does not tell the whole story!
"WE ARE IN THE SAME STORM, BUT NOT ALL IN THE SAME BOAT"
WHO'S ESPECIALLY AT-RISK TO EXTREME HEAT IMPACTS?

- Older adults
- Children
- People with chronic illness
- Pregnant people
- Outdoor workers
Heat-related Illness

- Advanced age
- Previous heat-related illness
- High temperature & humidity
- Direct sun exposure
- Indoor radiant heat sources
- Limited air movement
- Lack of recent exposure
- Not enough fluids
- Physical exertion
- Physical condition & health problems
- PPE & clothing
- Medications
- Pregnancy

Image from: eclosh.com
WHOS ESPECIALLY AT-RISK TO EXTREME HEAT IMPACTS?

- Older adults
- Children
- People with chronic illness
- Outdoor workers

...but also people who
- live in older, poorly maintained apartment buildings;
- live in crowded apartments with intergenerational living;
- live in neighborhoods with less green space access,
- live in neighborhoods with more air pollution from buildings and industrial sites; and
- been exposed to air pollution across the lifespan
- stretch their resilience and their means across many hardships, such as food, rent, chronic illness, immigration concerns, and more,

....and it is all due to historical and systematic (environmental) racism
CLIMATE CHANGE
[Extreme heat]

ENVIRONMENTAL RACISM

ENVIRONMENTAL HEALTH IMPACTS
PEOPLE ARE STAYING AT HOME MORE THIS SUMMER.

Address energy insecurity

The inability to adequately meet basic household energy needs due to the interplay of physical conditions of housing, household energy costs and energy-related coping strategies.
EVERYONE HAS A RIGHT TO A HEALTHY & COOL HOME

WHAT MAKES A HOME ENERGY INSECURE?

- Planned brown outs in low income communities of color
- The wall insulation retains heat, so your home stays hot for days after a heat wave
- Short periods of utility failures, due to increased usage from air conditioners
- Choosing between turning your air conditioning on, or your oxygen machine
- Your landlord does not address maintenance issues like holes, cracks, leaks

WHAT MAKES A HOME ENERGY SECURE?

- A home that is well cared for by the landlord
- Access to energy efficient air conditioning & fans
- A home that remains at safe temperatures during extremely hot days
- A home that is well ventilated
- Affordable utility bills
- Healthy children & elderly
THANK YOU
Extreme heat impacts under a changed climate and opportunities for action

Juan Declet-Barreto
Senior Social Scientist for Climate Vulnerability
Climate Change has turned summer into a Danger Season

Goodbye, carefree summers—hello, ‘Danger Season’

The AMA has declared the warming climate ‘a public health crisis that threatens the health and well-being of all people’

by Erika Spanger-Siegfried — June 20, 2022 in influencers

Juan Declet-Barreto
@DecletBarreto

Dangerous heat index (108-112°F) forecast today for Mobile County, AL & nearby counties. @ClimateCentral says made 4 x more likely by #climatechange. More heat is in the forecast. Stay safe! #DangerSeason weather.gov/mob climatecentral.org/tools/climate-...

Scientists warn of summer ‘danger season’ amid fires, floods and heatwaves
Killer Heat in the United States

Killer Heat in the United States
Climate Choices and the Future of Dangerously Hot Days
Heat Index
Above 90°F
Outdoor workers become more susceptible to heat-related illness.

Heat Index
Above 100°F
Children, elderly adults, pregnant women, and people with underlying conditions are at heightened risk of heat-related illness.

Heat Index
Above 105°F
Anyone could be at risk of heat-related illness or even death as a result of prolonged exposure.

Heat Index
Off the Charts
Undetermined: any level of exposure is presumed extremely dangerous for all people and likely to result in heat-related illness or even death.
## Annual Days of Extreme Heat Per Year in Utah’s 2nd District

<table>
<thead>
<tr>
<th>Heat index above</th>
<th>Historical</th>
<th>By midcentury</th>
<th>By late century</th>
<th>By late century, if we limit warming to 2°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°F</td>
<td>11 days</td>
<td>42 days</td>
<td>71 days</td>
<td>36 days</td>
</tr>
<tr>
<td>100°F</td>
<td>0 days</td>
<td>4 days</td>
<td>17 days</td>
<td>2 days</td>
</tr>
<tr>
<td>105°F</td>
<td>0 days</td>
<td>1 day</td>
<td>4 days</td>
<td>0 days</td>
</tr>
</tbody>
</table>

With no action to reduce global heat-trapping emissions, the average frequency of extreme heat in this district would rise as shown here. Taking rapid action to reduce emissions and cap future global warming at 2°C (3.6°F) would limit the increase in extreme heat days. For more information and detailed data, visit www.ucsusa.org/killer-heat.
Too Hot to Work
Extreme heat puts outdoor workers’ earnings at risk

- By midcentury, outdoor workers’ exposure to extreme heat would quadruple, risking $55.4 billion in annual earnings nationwide.
- Disproportionate impacts on outdoor workers of color
- The average outdoor worker risks losing more than $1,700 in annual earnings, though workers in the 10 hardest-hit counties risk losing nearly $7,000 per year on average.
- Outdoor workers in construction and extraction occupations are projected to face the highest total earnings at risk at about $14.4 billion annually, followed by those in installation, maintenance, and repair occupations at nearly $10.8 billion annually.
National Occupational Safety Standards for Heat

H.R.3668 - Asuncion Valdivia Heat Illness and Fatality Prevention Act of 2019
Federal and local action to create heat protections

• OSHA/DOL National Emphasis Program on heat illness
• Sen. Markey’s (D-MA) Preventing Health Emergencies And Temperature-related (HEAT) Illness and Deaths Act
• Congresswoman Coleman’s (NJ-12) Stay Cool Act
• Grijalva’s (AZ-3) Asunción Valdivia Heat Illness and Fatality Prevention Act
Thank You!

Questions?

Learn more:
www.ucsusa.org/killer-heat
https://www.ucsusa.org/resources/too-hot-to-work
What did you think of the briefing?

Please take 2 minutes to let us know at:
www.eesi.org/survey

Materials will be available at:
www.eesi.org/062422climatechange

Tweet about the briefing:
#eesitalk    @eesionline

Friday, June 24, 2022