



EPA Heat Island Reduction Program

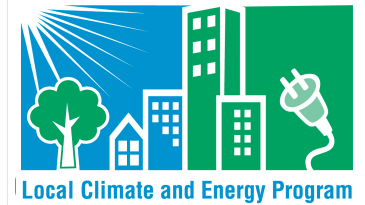
May 14, 2009

Alliance of Community Trees
Green Infrastructure Summit
Washington, D.C.

EPA Heat Island Program Manager: Neelam R. Patel



Outline



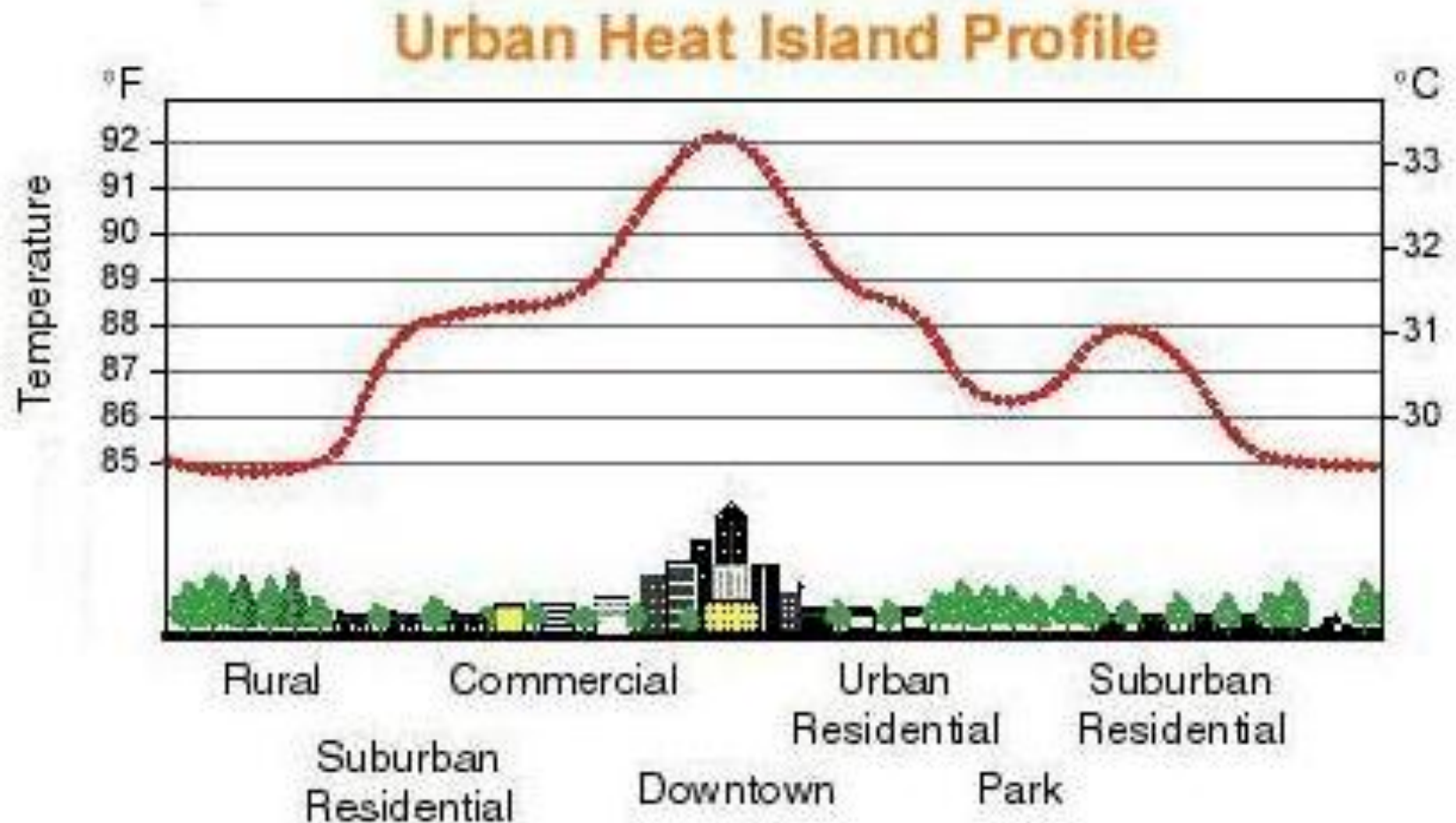
- Heat Island Overview
- EPA Heat Island Program
 - Program Resources
 - Potential Community Actions
 - Future Direction



Definition



- Micro-scale temperature differences between urban and rural areas
- Urban areas can be 5 – 15 ° C higher than rural areas



Formation

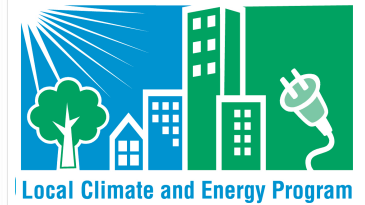


Formation of Urban Heat Islands

- Reduced vegetation
- Materials used to build urban infrastructure
- Urban geometry



Energy and Air Quality Impacts



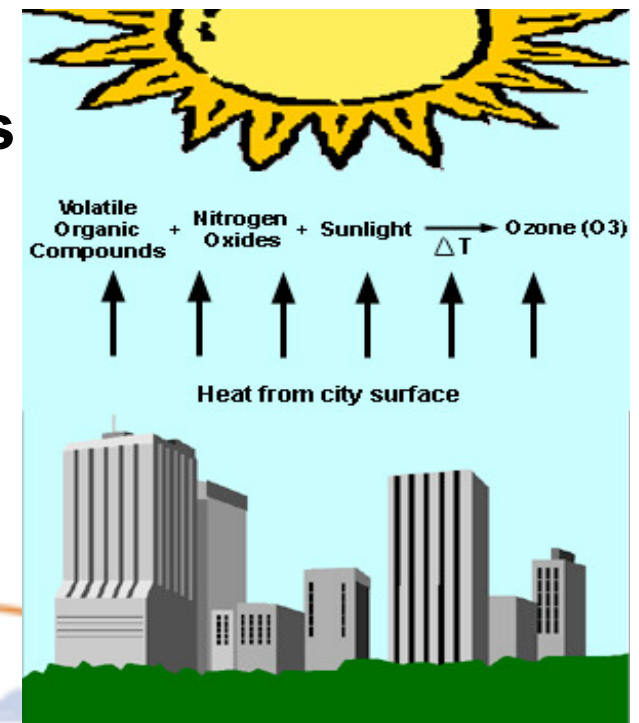
Impacts

■ Increased energy use

- 5 – 10 % of electricity demand is to cool heat islands effects
- 1.5 – 2.0% E demand ↑ for every 1 °F ↑ in the summer
- Longer peak periods; pressure on E grid; brownouts, blackouts

■ Air quality and greenhouse gas (GHG) emissions

- Ozone formation
- Increased air pollution
- Increased GHG emissions



More Impacts



Impacts cont'd

■ Human Health

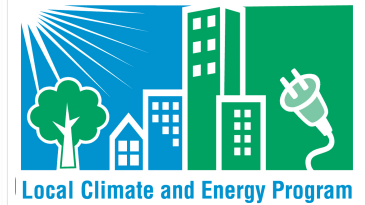
- Respiratory difficulties
- Heat cramps
- Heat exhaustion
- Non-fatal heat stroke/sun stroke
- Heat related mortality



■ Water Quality

- Warmer water runoff = ecological shock in waterways
- Increased water runoff = more pollutants in waterways

Mitigation Strategies

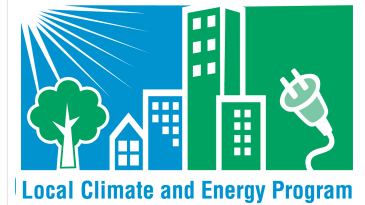


Communities can take action to reduce urban heat islands using four main strategies.

- **Trees and Vegetation**
- Green Roofs
- Cool Roofs
- Cool Pavements



Mitigation Strategy: Trees and Vegetation



Most U.S. Communities have opportunities to increase the use of trees and vegetation in their land cover and reap multiple benefits.

Strategically planting trees maximizes energy savings and reduce GHG emissions (among other things).

- Buildings
- Parking lots
- Streets
- and more



EPA Heat Island Reduction Program



Program Objective

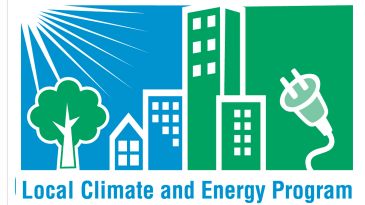
- Communicate policy, programmatic developments, and scientific, technological advancements to heat island community

Program Community

- Policymakers, program designers and program implementers
- Researchers/academia
- Industry, developers of new technology
- General public (e.g., K-12 students and teachers, coaches)
- Media



Messages to Heat Island Community



Topics of Interest to Scientific Community

- Heat island science, modeling, and measurement
- Innovative mitigation technologies in areas such as cool pavements, cool roofs, green roofs, and trees and vegetation

Activities for Programmatic and Policy Community

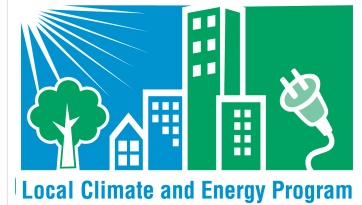
Voluntary Efforts

- Urban Forestry Programs
- Demonstration Projects (i.e., LBE)
- Weatherization
- Outreach and Education Programs
- Awards

Policy Efforts

- Procurement
- Resolutions
- Tree and Landscaping Ordinances
- Comprehensive Plans and Design Guidelines
- Zoning Codes
- Green Building Standards
- Building Codes
- Air Quality Requirements

Key Program Features

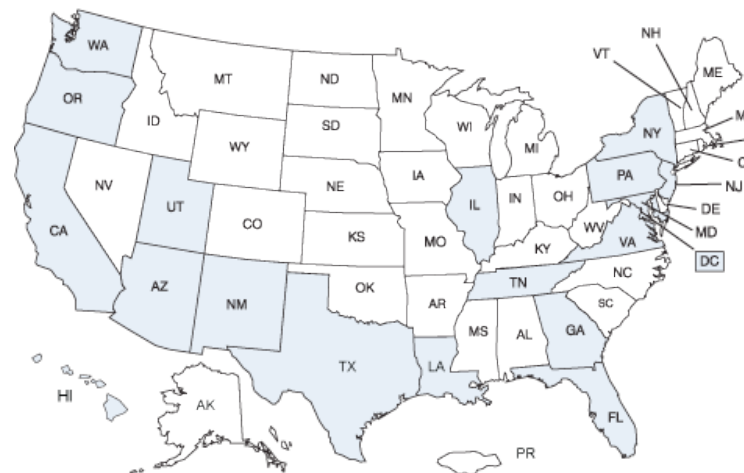


- **Website**, recently re-launched website, New features include user-friendly format, updated content, calendar of events, heat island in the news, featured webcast, updated database
- **Database**, “Where You Live”
 - Provides info on more than 75 local and statewide initiatives to reduce heat islands and achieve related benefits (*more on upcoming slide*)
- **Compendium of Strategies: Reducing Urban Heat Islands**
 - Document describes the causes and impacts of summertime urban heat islands and promotes strategies for lowering temperatures (*more on upcoming slide*)
- **Webcasts**, www.epa.gov/heatislands/resources/webcasts.htm
 - Quarterly online meetings for our diverse program audience spotlighting local/regional urban heat island programs, new scientific findings, and upcoming meetings
- **Listserve**, email EPA_heatisland_subscribe@icfi.com
 - Disseminates info to heat island community, e.g., funding opportunities, conference call for papers, webcasts, and more

Database



- Actions listed in the database are some efforts underway to cool communities while saving energy, reducing greenhouse gas emissions and improving air quality
- Each entry in the database includes a description of the activity, its current status, and a link to a website (if available) for more information.
- The database can be searched by:
 - Clicking on U.S. map (diagram on right)
 - State and locality
 - Initiative Type
 - Strategy
- If you are aware of heat island initiatives, please submit through our website.



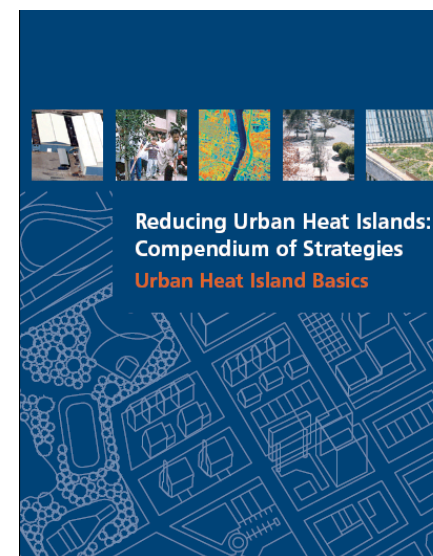
http://yosemite.epa.gov/gw/statepolicyactions.nsf/webpages/HIRI_Initiatives.html

Compendium



Reducing Urban Heat Islands: Compendium of Strategies

- Provides an overview of latest science, mitigation strategies, case studies, and recommendations for additional resources
- Chapters
 - Heat Island Basics
 - Trees and Vegetation
 - Green Roofs
 - Cool Roofs
 - Cool Pavements
 - Heat Island Reduction Activities



www.epa.gov/heatislands/resources/compendium.htm

Webcasts



- EPA holds free, national, quarterly urban heat island webcasts.
- Stakeholders from around the country inform each other of their urban heat island-related work.
- Scientists, practitioners, industry representatives, and government officials and staff all participate.
- Webcasts cover topics such as:
 - Measuring and Modeling Urban Heat Islands
 - Heat Island Impacts (e.g., air, water quality)
 - Mitigation (e.g., strategies, technologies, activities)
- Upcoming Webcast: Pavements, end of July/early August

<http://www.epa.gov/heatisland/resources/webcasts.htm>



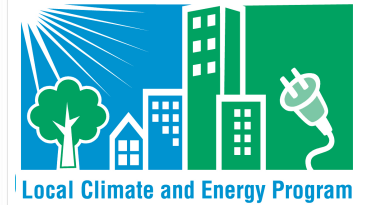
Program Direction



- Fold heat island messages into other EPA programs to promote multiple benefits of mitigation strategies
 - Stormwater Green Infrastructure Program
 - Green Scapes Program
 - Smart Growth, www.epa.gov/hiri/resources/pdf/smartgrowthheatislands.pdf
 - Brownfields Redevelopment
- Link to climate adaptation issues
 - Promote mitigation strategies to address heat health for local, regional and state programs
 - Use mitigation strategies to support actions for extreme weather (high rainfall, heat)



Other EPA Heat Island Activities



- EPA Regional Heat Island Activities – *Sustainable Skylines Initiative*

- Development and implementation of heat island mitigation program Dallas, TX
www.sustainableskylines.org/Dallas



- Development of program, “Parking Lots to Parks” Kansas City, KS and MO
www.epa.gov/region07/citizens/ssi.htm



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