



Frequent Heat Island Questions and Resources

This page features common questions about heat islands and provides related information and resources.

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1. What is a heat island?

Heat islands are urbanized (i.e., highly developed) areas that experience higher temperatures than outlying areas. In the United States, the heat island effect results in daytime temperatures about 1–7°F higher than temperatures in outlying areas, and nighttime temperatures about 2–5°F higher. Learn more about heat islands

<https://epa.gov/heatislands/learn-about-heat-islands>.

2. What causes heat islands?

Cities and other urbanized areas have fewer natural features, like trees, vegetation, and ponds, than outlying areas. Roadways, sidewalks, and buildings absorb and retain much of the sun's heat. Also, tall buildings and narrow streets trap air by reducing cooling air flow. These typical city structures and layouts create heat islands. Learn more about the causes of heat islands <<https://epa.gov/heatislands/learn-about-heat-islands#causes>>.

3. What are the impacts of heat islands?

The increased temperatures of heat islands are linked to several other negative impacts. First, heat islands increase energy demand and thereby increase air pollutants and greenhouse gases from fossil fuel power production. Second, heat islands can harm human health, particularly for those who are younger, older, have certain medical conditions, lack access to safe and cool spaces, and work outdoors. Third, heat islands can increase the temperature of stormwater runoff with harmful impacts to aquatic life. Learn more about the impacts of heat islands <<https://epa.gov/heatislands/what-are-heat-islands#impacts>>.

4. What is the difference between heat waves and heat islands?

Heat waves are extreme weather events that consist of a series of unusually hot days. Heat waves can lead to illness and death, especially for individuals in sensitive groups (see Question 3). U.S. data trends show that heat waves are occurring more frequently, and they are hotter and last longer. Explore EPA's Climate Change Indicators on Heat Waves <<https://epa.gov/climate-indicators/climate-change-indicators-heat-waves>>.

Heat islands occur where urbanized areas experience higher temperatures than outlying areas in general. Heat islands can occur without a heat wave, including during spring and autumn seasons. Heat waves may intensify the higher temperatures that exist within heat islands.

5. Is there a connection between heat islands and climate change?

Climate change and heat islands interact in important ways. In many areas of the United States, steadily increasing warming trends are intensifying already higher temperatures within heat islands, and this is expected to worsen in the future. Learn more about heat island trends <<https://epa.gov/heatislands/heat-island-trends>>.

6. How do heat islands affect people?

Heat islands can harm people's health in several ways. Higher temperatures:

- Increase the risk of heat stroke, heat exhaustion, and death
- Contribute to air pollution that worsens asthma and other chronic respiratory illnesses
- Affect quality of life by reducing time spent outdoors, causing irritability and stress, and driving up household energy costs
- Contribute to economic impacts like lost work and wages

Learn more about heat island impacts <<https://epa.gov/heatislands/what-are-heat-islands#impacts>>.

7. How bad is the heat island effect across the U.S.?

In the United States, the heat island effect results in daytime temperatures in urban areas about 1–7°F higher than temperatures in outlying areas and nighttime temperatures about 2–5°F higher. Humid regions (primarily in the eastern United States) and cities with larger and denser populations experience the greatest temperature differences. Heat islands can form under a variety of conditions, including during the day or night, in small or large cities, in suburban areas, in northern or southern climates, and in any season. On a global scale, climate change is making heat islands worse everywhere. Learn about measuring heat islands <<https://epa.gov/heatislands/measuring-heat-islands>>.

These tools offer local heat profiles for the United States:

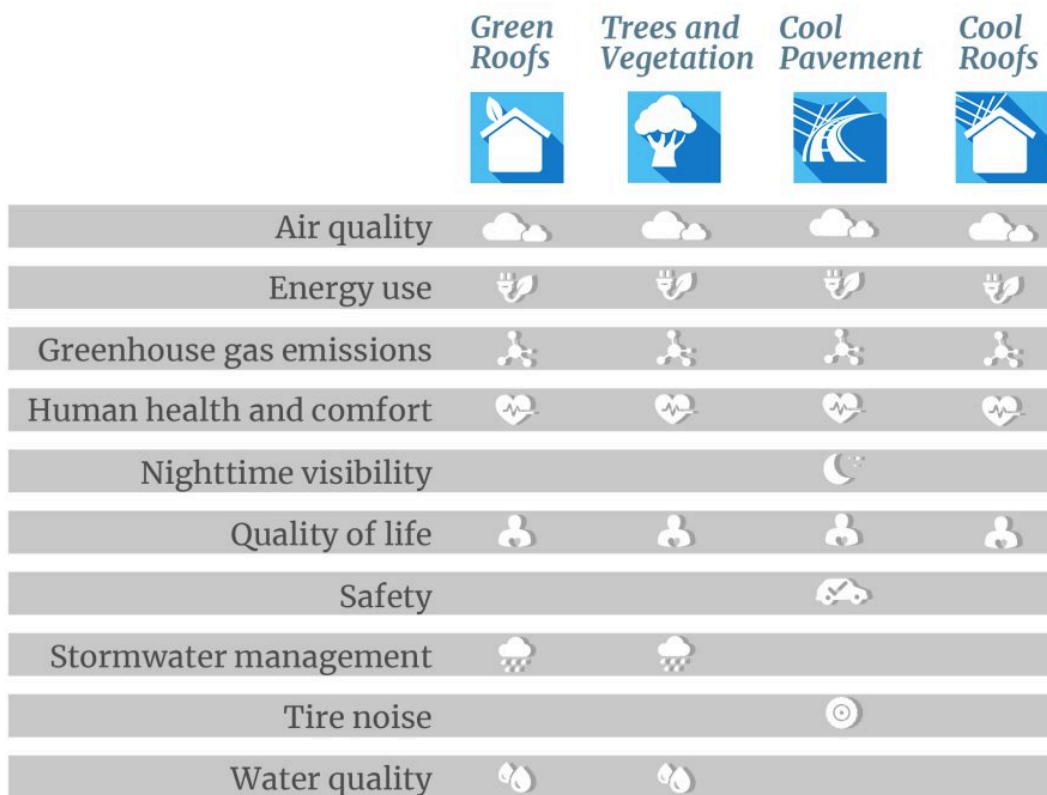
- Heat and Health Tracker – U.S. Centers for Disease Control and Prevention [🔗](https://ephtracking.cdc.gov/applications/heattracker/)
<<https://ephtracking.cdc.gov/applications/heattracker/>>
- Extreme Heat Vulnerability Map Tool – U.S. National Heat Health Information System [🔗](https://geoxc-apps2.bd.esri.com/climate/heatvulnerability/index.html)
<<https://geoxc-apps2.bd.esri.com/climate/heatvulnerability/index.html>>
- U.S. Surface Urban Heat Island Disparity Explorer – Data Driven Labs [🔗](https://datadrivenlab.users.earthengine.app/view/usuhiapp)
<<https://datadrivenlab.users.earthengine.app/view/usuhiapp>>
- ParkServe Urban Heat Island Mapping Layers - The Trust for Public Land [🔗](https://parkserve.tpl.org/mapping/)
<<https://parkserve.tpl.org/mapping/>>
- Global Surface Urban Heat Island Explorer - Yale University Center for Earth Observation [🔗](https://yceo.users.earthengine.app/view/uhimap)
<<https://yceo.users.earthengine.app/view/uhimap>>

8. How can heat islands be prevented or reduced?

Several measures can reduce elevated temperatures associated with heat islands. These strategies involve changes to human-built structures including buildings, roads, and other infrastructure to lessen the extent to which they absorb and re-emit the sun's heat. Strategies include planting trees and other vegetation, constructing green roofs, installing cool roofs, using cool pavements, and applying smart growth principles. Such strategies are often led by local governments through a mix of municipal programs and formal policies. Heat island cooling strategies offer other important benefits to communities including energy savings, lower greenhouse gases, reduced health risks, and improved quality of life.

- Learn about heat island cooling strategies <<https://epa.gov/heatislands/heat-island-reduction-solutions>>
- Learn how local governments are acting on heat islands
- Learn how individual community members can act on heat islands

Figure: Co-benefits of Heat Island Cooling Strategies



9. What are cities doing about heat islands?

Cities use many practices to reduce the heat island effect. Many communities operate voluntary programs that encourage residents and businesses to adopt heat island reduction strategies. Examples include tree planting or giveaway programs, and rebates or other incentives to install green or cool roofs. Many local governments also require certain practices to reduce the local heat island effect. Examples include zoning ordinances that dictate minimum criteria for vegetative coverage and building codes requiring cool roofs.

- Find what communities are doing to reduce heat islands
<<https://epa.gov/heatislands/what-communities-are-doing-reduce-heat-islands>>
- Explore the Community Actions Database <<https://epa.gov/heatislands/heat-island-community-actions-database>>

10. What can I do about heat islands?

- Planting more trees and greenery in your yard or community
- Working with community leaders to plan for more green spaces in your area
- Advocating for cool and green roofs on municipal buildings
- Constructing driveways and walkways with permeable pavers

Learn what you can do to reduce heat islands <<https://epa.gov/heatislands/what-you-can-do-reduce-heat-islands>>.

11. What is the best policy solution to heat islands?

There is no single policy solution to reduce heat islands; rather, communities must use a multi-strategy approach to reduce temperatures citywide. Considerations for selecting strategies may include:

- The local climate (e.g., arid)
- Preferred co-benefits (e.g., public health, energy savings, etc.)
- Other community environmental priorities (e.g., climate action targets, resilience plans)
- Funding opportunities (e.g., available grants, municipal budgets)
- Data on social vulnerability and risk factors of the local population (i.e., data showing greater impacts on underserved populations)
- The feasibility of enacting mandatory efforts (e.g., zoning or code changes) versus voluntary efforts (e.g., tree planting programs)

Find what communities are doing to reduce heat islands. <<https://epa.gov/heatislands/what-communities-are-doing-reduce-heat-islands>>

13. What is EPA doing about heat islands?

EPA's Heat Island Reduction Program <<https://epa.gov/heat-islands>> offers a variety of technical and outreach materials to raise public awareness and to help policymakers make informed decisions about heat island solutions:

- Heat Island Guide <<https://epa.gov/heat-islands/heat-island-compendium>>
- Heat Island Newsletter <<https://epa.gov/heat-islands/forms/heat-island-newsletter-signup>>
- Heat Island Community Actions Database <<https://epa.gov/heat-islands/heat-island-community-actions-database>>

EPA's Smart Growth <<https://epa.gov/smartgrowth>> program promotes a range of development and conservation strategies that can cool urban areas and make communities more attractive, economically stronger, and more walkable.

EPA's Green Infrastructure <<https://epa.gov/green-infrastructure>> program provides tools, technical assistance, and policy guides to help communities implement green infrastructure measures – such as green roofs and some types of pavements – that can diminish heat islands while also reducing stormwater runoff and limiting flooding risks.

EPA's Climate Change Indicators <<https://epa.gov/climate-indicators>> track decades of evidence of changes across multiple heat metrics including heat waves, high temperatures, seasonal temperatures, and heat related illnesses and deaths. EPA partners with dozens of data contributors to compile and keep these indicators up to date.

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