

Heat Islands

As buildings, roads and other infrastructure replace open land and vegetation, surfaces that were once permeable and moist become impermeable and dry. This causes urban regions to become warmer than rural surroundings, forming an “island” of higher temperatures in the landscape. Heat islands can occur both on the surface and in the atmosphere. On the surface, roofs and pavement can absorb heat, increasing the temperature in an urban area. Heat islands in the atmosphere are often influenced by the release of heat from these urban structures during the night.

There are many negative effects caused by heat islands. Higher summer temperatures increase energy consumption due to the demand for cooling buildings. This elevates emissions of air pollutants and greenhouse gases. Higher temperatures can have negative effects on human health and can contribute to respiratory difficulties, heat exhaustion and heat strokes. Water quality may also be affected as hot pavement and rooftops transfer excess heat to stormwater, which can affect aquatic ecosystems upon its discharge into natural water bodies.

Ways to help reduce the heat island effect include increasing tree and vegetative cover, creating green roofs, installing cool roofs, and using cool pavements.

<http://www.epa.gov/heatisland/index.htm>

Trees and Vegetation

Trees and vegetation help cool the environment and can reduce energy use, improve air quality, lower greenhouse gas emissions, enhance stormwater management and water quality, as well as provide aesthetic qualities.

<http://www.epa.gov/heatisland/index.htm>

Some creative ways for planting more trees have been implemented by the Oakland A’s and Houston Astros. The Oakland A’s have partnered with LA Nursery Sales of Suno to donate 171 trees, one for each home run, to Fremont Unified School District. The Houston Astros staff have partnered with Keep Houston Beautiful and have planted trees and cleaned up a city block.

http://mlb.mlb.com/news/article.jsp?ymd=20080421&content_id=2567055&vkey=news_mlb&fext=.jsp&c_id=mlb

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Green Roofs

Green roofs, also known as rooftop gardens, are vegetative layers grown on rooftops. They provide shade and remove heat from the air through evapotranspiration. This reduces temperatures on the roof and in the surrounding air. Green roofs can be installed on a wide range of buildings and can be anything from a two inch hardy groundcover to a park complete with trees. Green roofs can act as insulators for buildings and reduce energy use, which reduces air

pollution and greenhouse gas emissions. They improve human health and comfort, provide habitat for wildlife, and enhance stormwater management and water quality.

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Citi Field is considering building a green roof for the administration building roof. This would decrease energy needs of the building by insulating the roof from cold air in the winter and hot air in the summer. It will also decrease stormwater runoff by as much as 80 percent. The Washington Nationals have a 6,300 square foot green roof above a concession/toilet area which minimizes roof heat gain.

<http://yosemite.epa.gov/opa/admpress.nsf/d10ed0d99d826b068525735900400c2a/d87469e9e29de0238525740b004fc02c!OpenDocument>

http://washington.nationals.mlb.com/was/ballpark/green_ballpark.jsp

Cool Roofs

Cool roofs use materials to help reflect sunlight and heat away from a building to reduce roof temperatures. These materials can be used on flat roofs as well as steep sloped roofs. Benefits of cool roofs include reduced energy use and costs, reduced air pollution and greenhouse gas emissions, as well as improved human health and comfort. Cool roofs may impair some heat gain during the winter months, but overall, homeowners and business owners experienced energy savings with the use of these materials.

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The Nationals Park has installed roof materials that offer a high degree of reflectance, which minimizes the amount of heat released into the environment.

http://washington.nationals.mlb.com/was/ballpark/green_ballpark.jsp

Cool Pavements

Cool pavements are not as common and are still in research phases. However, these paving materials will reflect more solar energy, enhance water evaporation, and will remain cooler than conventional pavements. The benefits of cool pavements include reduced stormwater runoff and improved water quality. Permeable pavements will allow stormwater to infiltrate back into the soil. Permeable and nonpermeable cool pavements will lower stormwater runoff temperature.

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