

Urban Heat Island Effect

In cities like Atlanta, the high concentration of buildings, roads, and other artificial surface areas retain heat, making urban environments up to 10° C (18° F) warmer than rural areas.

Recall the Ecology Disrupted curriculum learning goals:

- Human daily life can disrupt ecological function leading to environmental issues.
- Scientists can collect data to investigate human impact local ecology.

Students watch additional Science Bulletins videos to learn about how human daily life can affect ecological function, and to pull out the ecological principles. An introduction to the video and background information are provided below.

While watching the Bulletins they will complete a graphic organizer with the following questions:

1. What abiotic factor(s) have people changed and what is the impact on the biotic factors in the ecosystem?
2. What is the evidence/data for your conclusion?
3. How has daily life contributed to this change and how is it affected?
4. What are possible solutions?

Introduction

"Think about the summertime. Have you ever come out of your apartment and felt the heat come up from the sidewalk and hit you in the face? How about stepping out of a car onto the blacktop? Do you feel the heat envelope you? This phenomenon has a name – The Urban Heat Island Effect. Think about the relief provided by sidewalk trees or the vegetation of a playground. This natural vegetation counteracts the urban heat island. We are going to watch another *Science Bulletin*. This one will be about urban heat islands in Atlanta, but what is true for Atlanta is true for New York City. In fact after this *Bulletin*, I will show you slides of the urban heat island in New York City. Get ready to fill out your graphic organizers."

Background Information

The heat island effect describes how urban areas that have large numbers of buildings and roadways have higher temperatures than surrounding rural and suburban areas. The concrete and other materials used to build the roads and buildings retain more heat than grasses and trees, which causes the higher temperatures. The buildings absorb heat during the day, and these "heat islands" like Atlanta (and NYC) show the highest temperatures during evenings and when there is little wind (up to 4° Celsius or 7° Fahrenheit warmer). These areas have longer growing seasons for plants, but the higher temperatures can affect weather patterns and human health. It is much hotter in these areas, which also increases the amount of energy used to cool these structures during summer months.

Note: Use the included slideshow with pictures of the urban heat island effect on NYC to connect this Atlanta example to New York.