



Earth Gauge™ Cleveland – The Built Environment

Environmental Information for Broadcast Meteorologists

This fact sheet is part of a series on key weather-environment topics for the Cleveland area. The Earth Gauge™ Healthy Communities project is designed to provide basic background information on environmental impacts in major U.S. urban areas, as well as simple messages meteorologists can deliver to their viewers.

Over the thirty-year period from 1960 to 1990, the population of Ohio increased by 11.8 percent with Cleveland increasing its urbanized area by 9.4 percent. As urban landscapes grow, associated environmental impacts in the community are often observed, including changes in air quality, water quality, flooding, and temperature extremes.

What is the Relationship between the Weather and the Built Environment?



Air Quality: Areas where land uses are separated (such as residential and commercial properties sited in different areas) often have a higher number of vehicle miles traveled per person. Cars are a primary source of air pollutants, including key ingredients for ground-level ozone and particulate matter pollution, which are of particular concern in Cleveland during the warm, sunny summer months.



Water Quality: Pavement prevents rainwater and snowmelt from soaking into the ground. Instead, water runs over paved surfaces and into storm drains, picking up any pollutants it encounters along the way. This mixture of pollution and water surface runoff often flows into local waterways impairing the aquatic ecosystem. It is generally accepted that when 10 percent of a watershed is paved, aquatic ecosystems begin to show stress; over 30 percent, they are considered impaired.



Flooding: Heavy rain events in urban areas can overload storm drains, gutters, and pipes. As water accumulates, it can overwhelm the capacity of sewer pipes and local rivers and streams, leading to flash flooding. Floodwater can damage property and contaminate drinking water supplies.



Temperature Extremes: Because pavement absorbs and traps heat, cities tend to be warmer than surrounding areas – a phenomenon known as the “urban heat island effect.” The effect can be especially pronounced in areas that have lost significant amounts of tree canopy. Elevated city temperatures result in increased energy demand for air conditioning, increased air pollution, and heat-related illnesses and deaths.

Learn More about Weather and the Built Environment

EcoCity Cleveland is addressing the way Cleveland grows by looking at the issues of housing, density, parks, transportation, and water resources. www.ecocitycleveland.org

EPA Smart Growth Program houses resources on many built environment topics. www.epa.gov/smartgrowth

Smart Growth America works to support coordination of development, transportation, revitalization of older areas, and preservation of open space and the environment. www.smartgrowthamerica.org

Flip this page over to find simple messages and tips about weather and the built environment you can use during your on-air weather report.



Earth Gauge

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Making the Connection: What You Can Say On- Air

Here are some simple facts and tips you can provide to your viewers to help make the connection between weather and Cleveland's built environment. Help your viewers understand the environmental impacts of a changing landscape, and how they can reduce their own impact.



Trees – Nature's Air Conditioners

Loss of tree cover in urban areas can result in "urban heat islands" where pavement and other hard surfaces absorb and trap heat, making the city feel three to ten degrees warmer than surrounding natural areas. Heat islands can result in higher energy demand for air conditioning and can contribute to heat-related illnesses and deaths.

Viewer Tip: Get planting! Planting on the east and west sides of your home can help to shade from heat during the mid-afternoon sun – walls that are shaded can be up to 36 degrees cooler than unshaded walls. Consider choosing deciduous trees (trees that lose their leaves in the winter), which will block sun during the summer, but allow warming sunlight through during the winter.

Know Your Flood Risk

Flooding can occur at any place and any time throughout Ohio, and is often associated with slowly-moving thunderstorms that produce heavy rainfall. In urban areas, where pavement has replaced forests and fields, there can be two- to six-times as much water runoff than would occur in a natural area, which can overwhelm local streams and rivers.

Viewer Tip: Know your flood risk! Over the course of a 30-year mortgage, a home has a 26 percent chance of being damaged by a flood, compared to only a nine percent chance of being damaged by a fire. Find out if you live in a flood-prone area, and make sure that you have an evacuation plan in place. You can learn your flood risk by visiting the flood risk tool at www.floodsmart.gov and entering your address.



"In the Heat of the Night"

Pavement and buildings in Cleveland absorb and trap heat in the city, and temperatures can be several degrees warmer in the city than surrounding natural areas. At night, these "hard" surfaces gradually release stored heat and raise night time temperatures, offering little relief during extreme heat events.

Viewer Tip: Asphalt, tar, and other dark pavement and roof surfaces absorb and hold heat, even after the sun sets. Thinking about adding or replacing a walkway at your home? Consider using materials that are less likely to absorb heat, such as gravel, grass, or mulch. Not only will these materials stay cool, but they'll also allow rain water to soak into the ground instead of running off into the street.

Transit Trek

One study of Americans using public transportation found that they spend about 19 minutes per day walking to and from transit stations. Not only does using public transportation reduce the number of cars on the road and decrease air pollution, but it may also help Americans fit in the recommended 30 minutes of exercise per day.

Viewer Tip: On nice days, consider walking to the bus stop, transit station, or all the way to your destination. You can learn more about Cleveland's transit system and map out a route by visiting www.gcrta.org.

