

“Cool Communities”: A New and Emerging Strategy for Pollution Prevention

by Lucie Griggs, Guest Writer

Heat islands are created when the built environment in an area increases dramatically as vegetation is eliminated, causing temperatures in the area to become several degrees (generally 6 to 10 degrees F) warmer than nearby natural environments. This phenomenon has been measured in the Metro Atlanta area in recent decades, as depicted in the aerial infrared photographs shown here. The black areas in these photos reflect the built environment, and the dark gray reflect vegetation and tree cover. Clearly in the 21 year period between these photos, the tree cover has diminished greatly as the heat-concentrating built areas have increased. The impact of this phenomenon on air and water quality are often overlooked, but have recently become the focus of major research projects at NASA, EPA, and DOE as well as respected universities.

Heat accelerates ozone formation and increases demand for air conditioning (indirectly creating more emissions from power generation); and high surface temperatures of impermeable surfaces increase the temperature and volume of storm-water runoff. Certain structures, especially asphalt parking lots and dark roofs, are much hotter, retain heat longer, and can affect the air temperature of entire neighborhoods. Studies show that by increasing the reflectivity (albedo) of these surfaces, planting more trees, and reducing the capacity of these structures to store heat, the high ambient temperature can be reduced and the potential for ozone formation will also be reduced.



The above photos reflect the increase in temperature in the metro Atlanta area from 1972 to 1993. The lighter color shows base temperatures, and rings of darker color show increase in temperature. On the left, in 1972 only a small area of elevated temperature existed, centered around downtown and Hartsfield International Airport. On the right, in 1993, temperatures have increased by 9-12 degrees F, and the heat islands have extended to much of the northern and eastern suburbs (Source: American Forests Global Releaf 2000).

“Cool Communities” strategies combine reflective roofing, lighter-colored and permeable paving materials (such as porous concrete), and strategic tree planting to provide simple, cost-effective, and innovative approaches to pollution prevention. These measures, used as a “system,” increase the effectiveness of heat island mitigation and can be implemented for new development, retro-fitting, and during normal maintenance cycles.

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