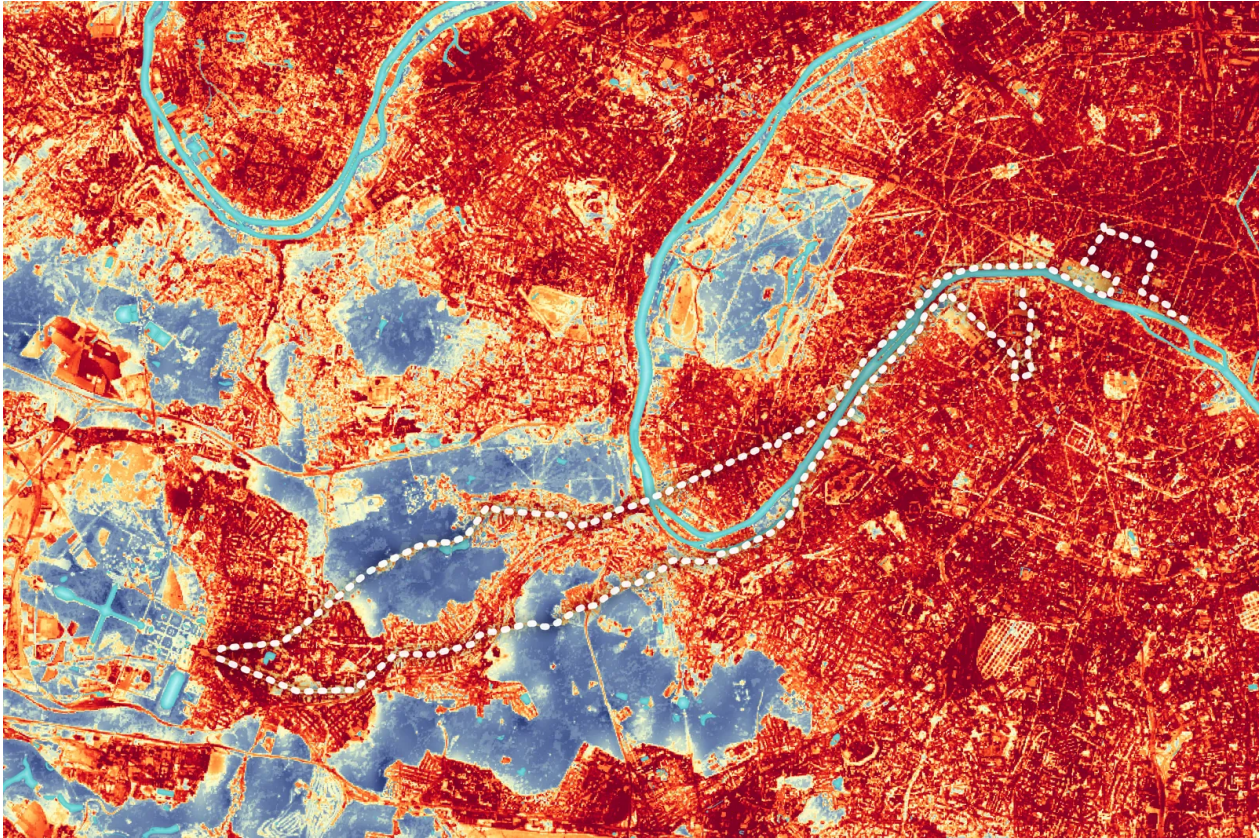


Urban heat island

By Lennart Kiil



Surface temperature in Paris on 6 August 2024, measured from a satellite. The dense districts (red) were far hotter than parks, woods and the river (blue).

NASA Earth Observatory, Wanmei Liang and Michala Garrison. Public domain. [Wikimedia Commons](#).

An urban region that is warmer than nearby surrounding rural areas.

Caused by higher heat absorption of the city surfaces, and less shade from trees and other vegetation.

In urban environments the vegetation and open land are replaced by buildings and roads. These structures are usually directly exposed to sunlight and therefore absorb heat during the day.

In rural areas the soil is generally more moist and cooled by evaporation. In addition the vegetation reduces surface temperature by evapotranspiration.

The urban structures on the contrary are characterized by dry materials, which do not cool much by evaporating water. Because of this, the surface temperature of the urban structures becomes significantly warmer than that of nearby rural areas. The cities will therefore stand out as heat islands.

The surface urban heat island effect is most pronounced during the day, when the Sun shines on the city.

The city releases this heat to the [atmosphere](#), and this creates another type of urban heat island, the atmospheric urban heat island. The difference in air [temperature](#) between urban and rural areas is larger during the night.

The extent of the urban heat island effect depends on the size and structure of the city. Tall buildings can slow the cooling of the city at night by blocking the radiation of heat from neighboring buildings. Parks and lakes within a city will cool the air.

Urban heat islands can influence the long term [temperature record](#) trends if rural weather stations become urbanized. Scientists have to correct data from such weather stations, or exclude them from their analyses.

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