

URBAN HEAT ISLAND

What does the data show and how do we perceive it?

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Urban Heat Island has become a very popular phenomenon since urbanisation has rapidly accelerated. To map the urban heat island, the NDVI (normalised differential vegetation index) is calculated, which quantifies green vegetation. It is derived from near-infrared and red channels, such as Landsat 8 band 5 and band 4, or Sentinel 2 channels B8A and B4, respectively. NDVI values range from -1 to 1, indicating biomass and chlorophyll content. Healthy vegetation absorbs blue and red radiation for photosynthesis. Calculating NDVI is the first step in determining Land Surface Temperature (LST), requiring radiation temperature and emissivity coefficient components.

The radiation temperature (T) is obtained using specific formulas incorporating thermal conversion constants (K1 and K2) stored in metadata, dependent on the sensor type and spectral channel. Next, the emission factor (ϵ) is determined. This involves calculating the Proportion of Vegetation based on the previous NDVI values and their minimum and maximum values.

By following this process, the urban heat island's impact can be mapped using NDVI, leading to the computation of LST. This provides valuable insights into the heat patterns of urban environments.