Comfort and Safety

comfortable

Overview

Indicator name	**Urban heat**		
Indicator number	28	**Indicator type**	Supplementary
Objective	To measure the current effects of urban heat island		
Application guidance	The built environment sits within a wider environmental context that is influenced by human activity. Urban areas can become significantly warmer than surrounding vegetated areas due to human activity and development, when cities replace natural land cover with dense concentrationsof pavement, buildings, and other surfaces that absorb and retain heat. This creates islands of urban heat, with temperatures differing more during the night than during the daytime. Changes in land use from grasslands to medium density result in the greatest increase in heat (0.5°C – 0.9°C). This indicator will support practitioners to understand the urban heat island effects across urban areas of NSW. Based on the outcome of the assessment, practitioners can determine whether mitigation measures such as greening will improve the urban heat island effect. It can also provide insights into the relationship between green cover or development proposals and urban heat. The practitioners can use the *urban heat island effect* metric to measure the effects of urban heat islands and the impacts of changing land uses.		

Metric

Urban heat island effect

Related indicators

Amenity and Use

13 Places to stop and rest

Green and Blue

19 Tree canopy
20 Biodiversity
21 Impervious surface
22 Waterways

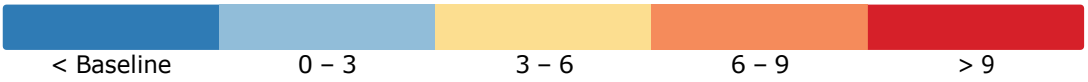
Character and Form

30 Building height

Recommendation

When complete and published by the Place Based Science team from DPIE, the '2019 urban heat island to modified mesh blocks dataset for Greater Sydney Region' could be utilised to provide a more up-to-date analysis of urban heat island effects. It is to be derived using the CSIRO 2018/19 LST and UHI estimates for Australian urban centres.

Metric – Urban heat island effect

Metric unit	Temperature difference (°C)
Description	To measure the temperature of an urban area, represented by the magnitude of deviation of urban land surface temperatures relative to a non-urban vegetated reference
Spatial coverage	NSW Urban areas (Sydney, Newcastle and Wollongong region)
Spatial application	This metric is most suitable for area-based analysis based on modified mesh blocks
Calculation methodology	1. Using the CSIRO 2018-19 UHI Estimates (Land surface temperature and urban heat island estimates for Australian urban centres) for Sydney and Newcastle. Practitioners will be able to use the Geotiff images to determine the urban heat island effect on urban areas along the east coast of NSW from Wollongong to Newcastle. 2. Assign colour based on classification below Unit: Temperature difference (°C) 
Assumption	N/A
Limitation	• The polygon dataset has been produced to monitor areas of urban heat island effect (UHI) in the Significant Urban Area and Greater Sydney Region for the summer season of 2015-2016. Developments post-2016 are not reflected in the data. • Data limitations confine the spatial coverage of this metric to major urban centres only, with analysis limited to the urban areas of Sydney, Newcastle and Wollongong
Data source	• CSIRO 2018-19 UHI Estimates: data.csiro.au/collections/collection/CIcsiro:25232v2 • ABS Mesh Block 2021: https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/access-and-downloads/digital-boundary-files/MB_2021_AUST_SHP_GDA2020.zip • NSW Urban Heat Island to Modified Mesh Block 2016: datasets.seed.nsw.gov.au/dataset/nsw-urban-heat-island-to-modified-mesh-block-2016

Reference

- CSIRO, Estimation of Land Surface Temperature and Urban Heat Island effect for Australian urban centres (2017)
- OEH, User guide for OEH urban heat and green cover datasets (2019)
- CSIRO, LST and UHI for Australian capital cities - processing notes (2018-19)
- WSROC, Urban Heat Planning Toolkit (2021)