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Table S1. Articles in the Review That Include Case Studies

Articles (N=47)	Case study city	Temperature and increase in UHI intensity recorded for the case in the article reviewed	Köppen-Geiger Macroclimate of the cities studied
Abdulateef et al. 2022	Baghdad city, Iraq (Asia)	SUHI intensity in Baghdad city is about 17°C which indicates a high value of such a phenomenon. When this intensity was compared with previous studies, it was found that Baghdad city suffers from a rapidly growing SUHI phenomenon. The results shows that the maximum difference of land surface temperature between the built-up and the surrounding area reach to 11.97 °C.	Arid (BWh)
Adinna et al. 2009	Enugu, Nigeria (Africa)	Figure 3 shows the distribution of surface temperature values. The radiant temperature ranged from 26 – 39°C.	Tropical (Aw)
Aflaki et al. 2017	Kuala Lumpur, Malaysia Singapore Hong Kong, China (Asia)	Kuala Lumpur: Average temperature has sharply increased from 38.8°C to 47.8°C. The intensity of UHI in the city centre was recorded as 4°C during the day and 3.2°C during the night. Singapore: The higher UHI intensities generally occurred during the southwest monsoon period of May-August, with a maximum of ~7°C observed in the commercial area under ideal meteorological conditions. Hong Kong: Suffering from severe negative UHI effects, the annual UHI intensity in Hong Kong ranges between 2°C to 4 °C.	Tropical (Af) Tropical (Af) Temperate (Csa)
Barbierato et al. 2019	Rosignano Solvay, Italy (Europe)	Figure 3(b) shows thermal band of the Landsat 8 satellite. Despite having similar average temperature (34.6°C for Landsat LST and 33.8°C for downscaled LST). Table 1 shows Temperature data with and without urban forest for the current climate. The current temperature out of the canopy mean temperature is 35.5°C.	Temperate (Csa)
Bartesaghi et al. 2020	Sydney, Australia (Oceania)	Sydney is increasingly facing more frequent and prolonged heatwaves that intensify UHIs by raising inland temperature by as much as 10°C more than coastal zones. Table 1 shows meteorological conditions: summer T _{max} 34.0°C, winter T _{max} 18.5°C~19.3°C.	Temperate (Cfa)
Chen et al. 2020	Tianjin, China (Asia)	The simulation was run for July 21st, a typical extreme hot summer day in Tianjin with a mean ambient temperature of 28.9 °C, an average wind speed of 1.33 m/s, a southern wind pattern, and no precipitation.	Continental (Dwa)

Articles (N=47)	Case study city	Temperature and increase in UHI intensity recorded for the case in the article reviewed	Köppen-Geiger Macroclimate of the cities studied
Daniel et al. 2018	Paris, France (Europe)	For the reference scenario, the maximum daily temperature after seven days of heat wave is about 40 °C all over the urban area. At night, the minimum daily temperature varies between 25.8 °C in residential areas and 28.4 °C in the city centre. By way of comparison, one can remind that the temperature thresholds that are prescribed for heat wave warning over Paris region are 18 °C and 34°C for minimum and maximum daily temperatures, respectively (Lemonsu et al., 2014).	Temperate (Cfb)
Emmanuel et al. 2015	Glasgow Clyde Valley Region, UK (Europe)	Figure 10 shows measured temperature profile in Glasgow on 30 April 2011. The temperature ranges from 8°C to 19°C.	Temperate (Cfb)
Feyisa et al. 2014	Addis Ababa, Ethiopia (Africa)	The mean annual temperature range is 16–18°C. A review of climate records for over one hundred years by Conway, Mould, and Bewket (2004) shows an increase of minimum and maximum air temperatures in Addis Ababa of 0.4°C/decade and 0.2°C/decade, respectively.	Temperate (Cwb)
Giannakis et al. 2016	Nicosia, Cyprus (Europe)	The average daily mean temperature at the meteorological station in Nicosia was 30°C during both the June and July survey periods, while the long-term daily mean temperatures for this station are 27°C for June and 30°C for July (1980–2010). Temperatures in August are nearly identical to those in July. The analysis of variance indicated no significant differences between the temperatures recorded during the morning (8:30 a.m.) and evening (7:30 p.m.) interviews at the three locations (high, medium, low vegetation) and across the two time slots (morning and evening). However, evening questionnaire surveys were associated with slightly higher air temperatures (29.2°C vs. 28.1°C on average)	Arid (BSh)
Gill et al. 2007	Greater Manchester, UK (Europe)	Currently the maximum surface temperature of woodlands, the least built up urban morphology type (UMT), is 18.4°C, 12.8°C cooler than that of town centres, the most built up UMT, at 31.2°C. The maximum surface temperatures are 19.9°C in woodlands and 33.2°C in town centres by the 2080s Low and 21.6°C and 35.5°C by the 2080s High. Thus, by the 2080s there are increases in maximum surface temperature of between 1.5°C and 3.2°C in woodlands and 2°C to 4.3°C in town centres, depending on the emissions scenario.	Temperate (Cfb)
Hendel et al. 2017	Paris, France (Europe)	Over the course of the selected period, outside air temperature ranged from 18.3°C to 39.5°C, while average bedroom temperature ranged from 26.4°C to 31.9°C for internal thermal insulation (ITI) and from 26.0°C to 28.5°C for external thermal insulation (ETI).	Temperate (Cfb)

Articles (N=47)	Case study city	Temperature and increase in UHI intensity recorded for the case in the article reviewed	Köppen-Geiger Macroclimate of the cities studied
Herath et al. 2018	Colombo metropolitan Region (CMR), Sri Lanka (Asia)	The CMR climate is affected by Asiatic monsoon and existing high temperatures and humidity values (Fig. 1) are creating an inconvenient thermal environment throughout the year (Johansson et al., 2004). Some research studies on UHI issues had reported that CMR had temperature in tensities ranging from 0.09°C to 4.4°C over the selected 'rural' areas (Perera et al., 2012). Figure 1. shows annual average maximum/minimum temperature. the maximum temperature ranges from 30°C to 31°C and minimum temperature range from 22°C to 25°C.	Tropical (Af)
Jim 2015	Hong Kong, China (Asia)	The warm months, running from May to September with the hottest days exceeding 33°C, coincide with the rainy season with annual precipitation of over 2300 mm. The rather short and mild winter has average temperature above 10°C. With a long, hot and humid period, air-conditioning is used in most commercial, residential and institutional buildings. In the tropical city, solar-heat absorption and artificial heat generation have accentuated the urban heat-island (UHI) effect which is superimposed on the global warming trend. Hot weather warning (maximum daily temperature above 33°C) and hot-night phenomenon (nighttime temperature above 28°C) are getting more frequent in recent years (Fig. 4).	Temperate (Csa)
Kingsborough et al. 2017	London, UK (Europe)	The combined effects of the urban heat island (UHI) and climate change are projected to significantly increase summer temperatures and the number of heatwaves in London (McCarthy et al., 2010; Mavrogianni et al., 2011; Murphy et al., 2009).	Temperate (Cfb)
Kleerekoper et al. 2012	Utrecht and Den Haag, Netherlands (Europe)	No temperature data provided.	Temperate (Cfb) Temperate (Cfb)
Kondo et al. 2021	Fukuoka, Japan (Asia)	A questionnaire survey on global warming and the urban heat island effect was carried out with Fukuoka residents in January 2018.	Temperate (Cfa)
Liu et al. 2018	Chengdu-Chongqing, China (Asia)	The station-averaged monthly mean, mean minimum, mean maximum, extreme minimum, and extreme maximum temperatures in July of the urban stations were 1.58 K, 1.60 K, 1.51 K, 1.84 K and 1.40 K higher, respectively, than those of the rural stations. The monthly averaged July 2-m air temperature increased by 0.93 K on average for the urban grids in 2010, compared with the crop run; and the most significant warming was observed in the main urban area of Chengdu (1.86 K; Fig. 3a1). Units: K (Kelvin)	Temperate (Cwa)

Articles (N=47)	Case study city	Temperature and increase in UHI intensity recorded for the case in the article reviewed	Köppen-Geiger Macroclimate of the cities studied
Mabon et al. 2018	Taipei Metropolis, Taiwan (Asia)	Global warming and rapid urbanisation are significantly increasing temperatures in Tai pei (Bai, Juang & Kondoh, 2011; Hsu et al., 2011). Under the IPCC RCP 8.5 scenario (business as usual), Taipei will see average summer temperatures increase by 1.125–1.25 °C over the 2021–2040 period (Taiwan Climate Change Protection and Information Platform [TCCIP], 2017). Even under the RCP 2.6 scenario (i.e. radical emissions reductions), Taipei average summer temperatures are still set to increase by 0.625–0.75 °C over the same period (TCCIP, 2017).	Temperate (Cfa)
Macintyre et al. 2021	Birmingham and the West Midlands, UK (Europe)	In the UK, the UHI for a number of cities has been estimated at 1–2 °C in winter, and 2–3 °C in summer (Kershaw et al., 2010). To contextualise our results, for the same winter period and region, we previously showed that the regional population-weighted mean UHI intensity was +1.5 °C (+1.54 °C at night, +1.36 °C during the day), with the mean UHI intensity being highest in the city centre, at +2.4 average over winter, and +2.5 °C on C at night. In contrast to the typical summer UHI, which tends to be more intense during the night than the day, the UHI was more similar between day and night in winter (Macintyre et al., 2021).	Temperate (Cfb)
Maimaitiyiming et al. 2014	Aksu City, Northwestern China (Asia)	No temperature data provided.	Arid (BWk)
Makido et al. 2019	Portland, Oregon, USA (North America)	Summer highs have been increasing each year since 2010. In 2017, a new record was set for days over 80 degrees Fahrenheit [26.7 °C] in the month of August (27 days), bypassing the previous record set just one year earlier. Also in 2017, the city experienced 24 days at or above 90 degrees Fahrenheit [32.2 °C], twice the normal value of 12 days per year [42].	Temperate (Csb)
Marando et al. 2019	Rome, Italy (Europe)	In spring and summer, during the day, Tair of the urban station was, on average, around 1°C higher than the rural and natural ones (Fig. 3a, c). Average nocturnal Tair recorded in the urban site were 1.85 and 2.15°C higher than that measured in the rural station in spring and summer, respectively (Fig. 3b), and this difference was even higher considering the natural site of Castelporziano (2.81 and 3.17°C in spring and summer, respectively, Fig. 3d). Average summer LST values (Fig. 4a) range from 27.5 to 50.2°C. In correspondence of the most sealed surfaces in the city centre and in residential and industrial areas, LST values range from around 39 to 43°C.	Temperate (Csa)
Masson et al. 2014	Paris, France (Europe)	No temperature data provided.	Temperate (Cfb)

Articles (N=47)	Case study city	Temperature and increase in UHI intensity recorded for the case in the article reviewed	Köppen-Geiger Macroclimate of the cities studied
Nazarian et al. 2019	Singapore (Asia)	As UHI is expected to be maximum at night, the results are centred around nighttime, with sunset and sunrise hours identified at 19:00 and 07:00 local time, respectively. The diurnal variation of measured UHI corresponds to the averaged observations between March 2003 and March 2004 at the commercial district and between June 2003 and March 2004 at the residential neighbourhood [9]. The uncertainty range is situated between ± 0.25 °C for both rural and urban measurements, with the total uncertainty range of ± 0.35 °C for UHI, depicted by the gray area in Fig. 5. The maximum UHI values simulated here agree well with the measured data for both urban neighborhoods, corresponding to 3.0 °C and 3.7 °C for the residential and commercial areas, respectively.	Tropical (Af)
Park et al. 2014	Suwon, Anyang, Bucheon, South Korea (Asia)	No temperature data provided.	Temperate (Cwa) Temperate (Cwa) Temperate (Cwa)
Park et al. 2021	Seoul, South Korea Tokyo, Japan (Asia)	The surface urban heat island intensity in Tokyo (12 °C) was 1.5 times that in Seoul (8 °C) (Rizwanetal., 2008).	Continental (Dwa) Continental (Dwa)
Pascal et al. 2021	Paris, France (Europe)	Temperatures were higher in Paris and Petite Couronne, ranging from 10.1 to 32.5 C compared to 8.5 to 31.5 ° C in the Grande Couronne (Table 1). Between 18 and 26 heat waves were identified from 1990 to 2015 depending on the department. Heat waves classified as extreme were only observed in 1990 and 2003.	Temperate (Cfb)
Ramakreshnan et al. 2019	Greater Kuala Lumpur, Malasia (Asia)	Greater Kuala Lumpur (GKL), a developing tropical city of Malaysia suffered inevitable territorial urban development that manifested into formation of severe UHIs with an average gain in surface temperature of 8.47°C between 1997 and 2013 (Yusuf, Pradhan, & Idrees, 2014).	Tropical (Af)
Razzaghamanesh et al. 2016	Adelaide, Australia (Oceania)	In the summer, the maximum average temperature is 29°C but there is considerable variation in temperature and Adelaide can usually expect around a week every year when the day-time temperature is 40°C or above (Sturman and Tapper, 2006). Fig. 2 shows Adelaide meteorological variability during the study period.	Temperate (Csa)
Richardson et al. 2009	Montreal, Canada (North America)	The island, with a population of approximately 1.9 million people (Statistics Canada 2001), experiences an average daily high temperature of 26.2°C and an average daily low of 15.6°C in the month of July, the warmest month of the year (Environment Canada 2009). It is projected that due to climate change Montreal will experience more frequent intense heat days and a stronger UHI effect (Bourque and Simonet 2008).	Continental (Dfb)

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Rushayati 2016	Jakarta, Indonesia (Asia)	Surface temperature derived from Landsat satellite imageries showed that most of Jakarta Province was greater than 30°C (Fig. 4). The extent of the high surface temperatures illustrates that in Jakarta have occurred Urban Heat Island (UHI).	Tropical (Am)
Senosiain 2021	Amurrio, Spain Balmaseda, Spain (Europe)	No temperature data provided	Temperate (Cfb) Temperate (Cfb)
Sharma et al. 2018	Chicago, USA (North America)	During the seven-day heat wave, maximum temperatures exceeded 32 °C with little relief at night (Hayhoe et al 2010).	Continental (Dfa)
Shih 2017	Taipei metropolis, Taiwan (Asia)	According to the Central Weather Bureau of Taiwan (2014), the annual average air temperature from 1981 to 2010 in Taipei City is 23°C; the warmest month is July (29.6°C) and the coolest month is January (16.1°C). According to two CWB weather stations, Taipei and Ban-ciao, the weather conditions on 9 June 2015 were warm and dry. At 10am the mean air temperature was 33.3 C at Taipei station and 32.8 C at Ban-ciao station, with relative humidity of 52% and 51% respectively.	Temperate (Cfa)
Shimazaki et al. 2021	Okayama, Japan (Asia)	The average maximum temperature in late August in Okayama is 32.7°C, according to the database from the Japan Meteorological Agency.	Temperate (Cfa)
Shimoda 2003	Osaka, Japan (Asia)	Figure 1 shows annual air temperature in Osaka, Japan, 1993-1996. The air temperature has increased by 2.3°C in the past 120 years. Figure 2 shows the change of the number of nettaiya (hot and humid nights) from 1883 to 2002. In Osaka, the normal daily maximum air temperature in August has already increased to 33°C and the maximum air temperature exceeds 35°C for typically 22 days per year.	Temperate (Cfa)
Stone et al. 2014	Atlanta, Georgia; Philadelphia, Pennsylvania; and Phoenix, Arizona, USA (North America)	Mean temperature thresholds of 28.7°C, 28.8°C, and 37.3°C were used to identify heat wave periods in Atlanta, Philadelphia, and Phoenix, respectively (temperature thresholds provided by Dr. Brooke Anderson, December 2013).	Temperate (Cfa) Temperate (Cfa) Arid (BWh)
Sturiale et al. 2019	Catania, Italy (Europe)	The average temperature in the area between 2000 and 2017 was 0.6679°C above the 20 th century average; the number of hot days (above 29°C during 24 h on average) increased from 2.35 days per year in the 20th-century to 5.222 per year from 2000 onwards.	Temperate (Csa)
Vargo et al. 2016	Atlanta, Georgia; Philadelphia, Pennsylvania; and Phoenix, Arizona, USA (North America)	No temperature data provided	Temperate (Cfa) Temperate (Cfa) Arid (BWh)

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Villanueva 2017	Mexicali, B.C. Mexico (North America)	The region has very arid climate, only 75mm of annual rainfall and extreme temperature conditions: maximum temperatures exceeded 50°C in summer and minimum temperature below 0°C in the winter.	Arid (BWh)
Vuckovic et al. 2019	Vienna, Austria (Europe)	Figure 7. shows hourly distribution of air temperature and relative humidity for the reference summer period. And Table 5 shows overview of the weather statistics for study period in August, Maximum temperature from 28.5°C to 31.7°C. Average Temperature is from 22.7°C to 24.6°C.	Temperate (Cfa)
Wang et al. 2016	Montreal, Canada (North America)	The research carried out in eight Canadian cities found that the observed number of annual hot days (with a temperature high of 30°C) is expected to increase from 10 days, the 1961-1990 average, to 22 days after 2020.	Temperate (Dfb)
Xu et al. 2019	Xiamen City, China (Asia)	Figure 3 shows the intensity of UHI shows a strong spatial heterogeneity in different urban communities, with a standard error of 2.10°C. The average intensity of UHI in the urban area is 4.25°C, which generally greater.	Temperate (Cwa)
Yiannakou et al. 2017	Thessaloniki, Greece (Europe)	Since 1951, the temperature in the city has been increasing. The average annual temperature increased by more than 1°C in the period 1958-1999, and this trend is expected to continue. This consequence of climate change, along with the expected increase in extreme climatic events, such as heat waves, is likely to increase UHI intensity [12,13].	Temperate (Cfa)
Yu et al. 2017	Fuzhou, China (Asia)	The monthly 24-h average air temperature ranges from 10.9°C in January to 28.9°C in July, while the annual mean is 19.8°C. In recent years, Fuzhou has become the hottest city in China. For instance, in 2003, the maximum temperature exceeded 35 degrees on 24 days. On July 26, the 60-year-old temperature record for the city was broken by a temperature of 41.7°C.	Temperate (Cwa)
Zolch et al. 2016	Munich, Germany (Europe)	In Europe, the likelihood of experiencing heat days (with maximum air temperature >30°C) is projected to increase significantly during the summer months. Table 1 summarizes the meteorological input data. From datasets, diurnal cycles representing a typical heat day were selected because urban overheating and UHI effects are especially large during summer high pressure systems with high solar radiation and low wind speeds. Current climate mean air temperature is 26.4°C, max air temperature is 32.1°C.	Temperate (Cfb)

Table S2. Articles in the Review that Do Not Include Case Studies

Articles (N=25)	Article type
Akbari et al. 2016	<i>Review</i>
Charlesworth 2010	<i>Review</i>
Degirmenci et al. 2021	<i>Review</i>
Elgendawy et al. 2020	<i>International policy review</i>
Gunawardena et al. 2017	<i>Meta-analysis</i>
Harlan et al. 2011	<i>Review</i>
Hintz et al. 2018	<i>Review</i>
Hobbie et al. 2020	<i>Review</i>
Knight et al. 2016	<i>Review</i>
Koch et al. 2020	<i>Review</i>
Lanza et al. 2016	<i>National scope, US</i>
Larsen 2015	<i>Review</i>
Leal-Filho et al. 2018	<i>Review</i>
Lenzholzer et al. 2020	<i>Review</i>
Ouali et al. 2017	<i>Review</i>
Phelan et al. 2015	<i>Review</i>
Santamouris et al. 2018	<i>Review</i>
Sharifi 2020	<i>Review</i>
Takebayashi et al. 2018	<i>National scope, Japan</i>
Wang et al. 2019	<i>Simulation study, national Scope, USA</i>
Wang et al. 2020	<i>Statistical analysis</i>
Wang et al. 2021	<i>International survey</i>
Wheeler et al. 2019	<i>Review</i>
Yang et al. 2015	<i>Review</i>
Yow 2007	<i>Review</i>
Yumino et al. 2015	<i>Simulation study</i>