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## Using low cost sensors to assess soil temperature response to summer heatwaves in urban greenspaces.

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Urban green spaces regulate city air temperatures, particularly mediating the urban heat island effect. Urban below ground temperature regulation is less studied, but known to have a significant effect on urban heating by regulating temperature through heat transfer and thermal conductivity. The impacts of climate change, such as the increased frequency and intensity of heatwaves, will exacerbate urban heating effects, having significant impact on urban citizens. We installed low cost temperature sensors in topsoils across a gradient of urban green spaces (parking lots, rewilded areas, managed grassland, biodiversity plots, woodland) in the Cranfield Urban Observatory (UK). The soil temperature sensors measured continuously during June and July 2019 and included two periods of record breaking heatwaves in Europe in late June and July. As expected, the results showed significant variations in soil temperature between the urban green space types, where parking lot soils showed higher and flasher temperature regimes compared with all other green spaces. Urban woodland had significant dampening effects on soil temperatures. The managed green spaces responded differently to the heatwave events and grassland soils retained heat for longer compared with areas planted with wildflower mixes (biodiversity plots). Therefore, urban planning should prioritise the type of green spaces within urban developments to take into account the different regulatory effects of heat, particularly under the projected effects of a changing climate.