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Introduction to the Birmingham Climate Laboratory

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The Urban Heat Island (UHI) is a direct consequence of anthropogenic influences on our local climate. Many studies have been devoted to the study of UHI extent and magnitude, as well as the impacts increased urban temperatures have on meteorology, climatology, human health and society. Although the UHI phenomenon is well documented and studies have increased our understanding, the basic measurement of temperatures across urban areas remains very limited. Birmingham is the UK's second most populous city, with a population in excess of 1 million people and a well defined UHI. However, Birmingham has only two climate stations which when linked with the complex heterogeneous urban morphology results in extremely poor data coverage. This paper introduces the HiTemp project which will result in an unprecedented nested sensor network consisting of over 250 sensor sites dedicated to the measurement of urban heat. Three arrays of sensors are introduced, ranging from coarse (full weather stations) to fine scale (wi-fi temperature sensors covering the Central Business District and consisting of approx. 50 sensors per square kilometre). The end result will be a unique climate laboratory whose data will be made available for use by interested scientists / organisations on web-based GIS platforms.