

How cool is Uchimizu?

Anna Solcerova, Tim van Emmerik, Koen Hilgersom, Frans van de Ven, and Nick van de Giesen
TU Delft, Water Management, Delft, Netherlands (a.solcerova@tudelft.nl)

The Urban Heat Island (UHI) was first described 200 years ago, but ways to mitigate heat in urban areas reach much further into the past. *Uchimizu* is a 17th century Japanese tradition, in which water is sprinkled around houses, temples, and in gardens to cool the ground surface and the air, and to settle the dust. Nowadays, megacities such as Tokyo are aiming to revive the - by modern technology suppressed - method, and *uchimizu* is promoted by local authorities as a "clever way to feel cool". Unfortunately, the number of published studies that have quantified the cooling effects of *uchimizu* is limited, and only uses measurements of the surface temperature, or air temperature at a single height, as a measure of the cooling effect. In this research a dense 3D Distributed Temperature Sensing (DTS) setup was used to measure air temperature within once cubic meter of air above an urban surface with high spatial and temporal resolution. Six experiments were performed to systematically study the effect of (1) applied water amount, (2) initial surface temperature, and (3) shading on the cooling effect of *uchimizu*. We present the results and the subsequent analyses of these experiments, done during summer in Delft, The Netherlands. We show that this simple water sprinkling method has the potential to decrease extreme temperatures in impervious and paved parts of urban areas considerably. Besides mitigating the UHI, *uchimizu* practice is also an opportunity to increase awareness among citizens, and stimulate citizen participation in solving heat stress problems and energy saving. By providing refreshing insights on the cooling effect of *uchimizu*, we aim to contribute to the modern revival of this old tradition.