

## **Heat and dry islands observed over Jakarta, Indonesia, in 2012**

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**Abstract** Recent population increases in urban areas of Asian countries have extended artificial land cover, increased energy consumption, and caused various problems. Higher air temperatures over urban areas (heat islands) degrade residential environments and affect human health. In Jakarta, the largest city in Indonesia and the second largest city in Asia, previous studies have relied on only a few observation points and physically-based models. To study the thermal environment in Jakarta in more detail, we performed seven fixed-point temperature and humidity observations from the dry to the pre-monsoon season (from 16 September to 18 October) in 2012. Over densely urbanized areas, higher temperatures and lower humidity were observed around noon compared with the sparsely urbanized areas. The maximum differences in temperature and specific humidity were found to be around 3°C and 0.005 kg/kg, respectively. The differences in temperature and humidity became smaller in the afternoon because of the penetration of sea breezes. At night, the differences became larger again because the sea breeze weakened. Then, a difference of around 3°C was observed, except in the early morning. Although the difference in daytime temperature was smaller between densely urbanized areas and suburban areas, similar tendency was also confirmed in the daily time series averaged for sunny days in dry season.

**Key words** urbanization; heat island; dry island; Jakarta; observational analysis