

Land cover types and their effect on the urban heat signature of university campuses using remote sensing

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Abstrak

The campus, as an educational area, has a variety of land cover with varying surface temperatures. Knowledge of land use in a localized urban environment and its effect on the Urban Heat Signature (UHS) of a university campus is insufficient, so it is essential to assess UHS-related localized urban environments. The objective of this study is to assess land cover and its effect on the UHS of two university campuses. The research used spatial-temporal analysis employing satellite images during the period 2013-2014. The areas studied were the University Malaya (UM) and University Indonesia (UI) campuses. The results show that the land cover of both university campuses has the same localized urban environment pattern. Based on Landsat 8 TIRS (100 m ground resolution) resolution, we estimated that both university campuses had UHS profiles related to vegetation cover of 25-33oC, with a mean of 28oC as the lowest temperature, and building cover with a profile of 33-39oC, with a mean of 35oC as the highest temperature caused effect from Land cover types. Google Earth visual interpretation and digitalization provided the land cover based on 10m×10m vector square grids with their attributes validated by field survey. The research shows a trend of UHS change between 2013 and 2014, with the maximum temperature of >30oC on the UM and UI Campuses with increased of temperature 1oC. The study concludes that the UHS behavior is an effect of its temporal relation with land cover, which is new knowledge on university campuses about localized urban environments.