Temperature rising caused by land-cover change analyzed with satellite imagery

The land-cover change in some Japanese city-area was analyzed by satellite imagery, and it is analyzed with the seasonal climate change and the inter-decadal climate change in the cities. At first, the observed temperature was analyzed by below:
1) The inter-decadal trend of the daily minimum, mean and maximum temperature for each month was analyzed.
2) The linear regression of the temperature trend was calculated for the significant changes in temperature. And the slope of temperature change in each observation point was plotted on the map.
3) It was analyzed the relationship between the land-cover change and the temperature trend, accepted a five-year average minimum temperature. Surface analysis has held with the LANDSAT TM/ETM+ and ALOS-AVNIR2 imagery, and the meteorological observation stations were pointed on the map and land-cover statistics were calculated with some radiuses as buffers around the observation stations at city/suburban/rural area. The best correlation between the NDVI and temperature made difference of the maximum and minimum radiuses.
As a typical example of the relationship between the land-cover and the temperature, the daily minimum temperature in January was analyzed by the multiple regression analysis using the statistical temperature in a radius around the meteorological observation stations. In the result of analysis, multiple regression coefficient of each case showed positive at visible green and visible red bands, otherwise negative at visible blue and near-infrared bands. Especially, the coefficient of visible red indicated relatively large. This is why the increase of temperature had a strong impact on the reflection of concrete, asphalt and other land-cover material.

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