

Study of land surface temperature concerning land-use in Tabriz city using the Landsat 8 data

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Received: 2021 January 05

Accepted: 2021 May 11

Abstract

In the process of urbanization, proper land-use planning is critically important. Because the way man uses the land causes significant effects on the temperature of the city. In this regard, this research aimed to study the land surface temperature (LST) concerning land use. The research data includes the land-use shapefile and Landsat 8 image for day time (path = 168, row = 32; July 2020). Retrieval of LST done by ArcMap software. In addition, to investigate the difference in average temperature between different land-uses Kruskal-Wallis test in SPSS was used. The results showed that the average temperature of Tabriz City was $28.41^{\circ}\text{C} \pm 4.62^{\circ}\text{C}$. Furthermore, its minimum and maximum temperatures are 13.55°C and 39.29°C , respectively. Also, based on the different land-uses, Tabriz Airport has the highest average temperature with an average temperature of $33.81^{\circ}\text{C} \pm 1.81^{\circ}\text{C}$ compared to other land-uses. Then, military lands, barren lands, industrial lands, river, green space, under construction lands, and constructed lands with an average temperature of $32.22^{\circ}\text{C} \pm 2.52^{\circ}\text{C}$, $30.57^{\circ}\text{C} \pm 3.51^{\circ}\text{C}$, $30.51^{\circ}\text{C} \pm 2.71^{\circ}\text{C}$, $30.07^{\circ}\text{C} \pm 2.53^{\circ}\text{C}$, $29.88^{\circ}\text{C} \pm 2.94^{\circ}\text{C}$, $25.62^{\circ}\text{C} \pm 3.22^{\circ}\text{C}$ and $23.61^{\circ}\text{C} \pm 3.91^{\circ}\text{C}$, have the highest average temperature, respectively. Further, between the land-uses LST was significantly different ($\text{sig} = 0.000$). In the following, based on pairwise comparisons, it was observed that except for the green space and river average temperatures, there is a statistically significant difference between the average temperatures of all land uses. In the following, based on pairwise comparisons, it was observed that except for the green space and river average temperatures, there is a statistically significant difference between the average temperatures of all land uses.

Keywords: Thermal Remote Sensing, Statistical Analysis, Landsat 8 Satellite.
