



Investigation of Surface Temperature Changes Using Landsat 8 Satellite Image Processing in Ahvaz

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Extended Abstract

Introduction

The expansion of industrialization and migration of the rural population to urban areas has caused the excessive growth of the urban population in the past years. The rapid growth of the population and the development of the infrastructure of the city will cause changes in the urban pattern, and with the destruction of the environment and the replacement of buildings, it will cause environmental pollution and climate changes. Many studies have been done in the field of land surface temperature using various satellite data. Summary of the results obtained from the researches, it was found that firstly, satellite images provide acceptable and referable results in estimating the temperature of the earth's surface. Second, the different methods of estimating the surface temperature of the earth give almost the same results. And thirdly, different uses have a direct relationship in reducing or increasing the temperature of the ground surface in cities, all of which should be considered in various researches regarding the estimation of the ground surface temperature in urban areas. The main purpose in this study is estimated Land surface temperature based on land-use and land cover.

Methodology

The aim of this research is applied Landsat 8 surface temperature based on LULC. In this research, documentary sources, libraries and satellite images have been used for estimating LST from Landsat data.

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Results and Discussion

Using Landsat 8 (OLI) satellite images and after atmospheric and geometric corrections were made on these images, the vegetation cover index was extracted, with a maximum value of 0.64 in the north of the study area and an intermediate value of 0.2 along the Karun River and Finally, it forms the southwest of the region. The minimum value of this index is -0.36 in the southeast and northwest. The land surface temperature index (LST) is obtained using the mentioned relationship. According to the results, the highest temperature is related to industrial uses and the lowest temperature is related to technology education and research use. The reason for the high temperature in industrial use is that, for example, the steel industry has several furnaces that have a temperature above 70 degrees Celsius.

Conclusion

This research was done with the aim of estimating the ground surface temperature of Ahvaz city using Split-Window algorithm. Based on the data obtained from the temperature of each of the urban uses and based on statistical analysis, it was found that there are significant differences in each of the uses. The increase in surface temperature at night compared to the early years of the studied period can be caused by the significant role of the type, particle size and color of construction materials in urban areas in the amount of reflection and absorption of solar energy, the development of the city and the special heat effect of urban uses.

Keywords: Ahwaz, Landsat 8, Ground surface temperature, LST.