

Spatiotemporal distribution of Industrial Regions and Impact on LST in the case of Kocaeli, Turkey

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Key words: Geoinformation/GI; Remote sensing; Risk management; LST, industrial regions

SUMMARY

Monitoring of urban sprawl especially growth of industrial regions is an important task to maintain the balanced and sustainable development, to understand status of urban air pollution and ecosystems and to support urban planning. Additionally, it is also a fact that the increase in industrial areas negatively affects the global warming. Remote sensing images provide fast monitoring of multi-temporal spatial data and GIS (Geographic Information Systems) Technologies has become an important tool for handling these spatial data. Satellite images are useful for land use mapping, change analysis, object determination, etc., as well as thermal bands provide opportunity to determine the land surface temperatures (LST).

Kocaeli is a high dense industrialized city with industrial institutions in various sectors as Petroleum Refineries, automotive, chemistry, textile, machine, food, paper, wood, tanning, coal, etc.. This paper aims to analyze the spatiotemporal change of industrial regions and determine the impact of these changes on surface temperature in industrial regions within 14 years period in the case of Kocaeli, Turkey. The change in industrial regions were determined with raster-based analysis by handling Landsat 7 ETM+ and Landsat 8 OLI; satellite images belong to 2002 and 2016 years respectively. The remote sensing images were classified before the change analysis. As a result of the process, 35.15% increase in the field of industry has been observed for 14 years. Land surface temperature (LST) analysis were determined by handling Landsat 7 and Landsat 8 OLI; satellite images belong to 2000 and 2016 years respectively. The spatiotemporal distribution of industrial region and its impact on surface temperature was investigated by analyzing the LST changes on industrial regions.

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FIG Congress 2018

Embracing our smart world where the continents connect: enhancing the geospatial maturity of societies
Istanbul, Turkey, May 6–11, 2018