

Evaluation of the Effect of Landuse Growth on Land Surface Temperature Using Remote Sensing; a Case Study of Awka Capital Territory, Nigeria.

Joel Igbokwe, Esomchukwu Igbokwe, Nkechi Baywood and Uchenna Duru (Nigeria)

Key words: Education; Land management; Remote sensing; Spatial planning

SUMMARY

This study evaluated the effect of land use growth on land surface temperature of Awka Capital Territory, Nigeria using remote sensing. Its objectives were to examine the spatial dynamics of land surface temperature in regards to landuse change in the study area between 1990 and 2017 and to examine the relationship between land surface temperature and the respective landcover/landuse in Awka Capital Territory. The methodology involved the acquisition of Landsat images for 1990, 1999, 2008 and 2017, image preprocessing for the acquired images, image classification to determine the landcover/landuse extent in the study area and derivation of land surface temperature using the thermal band of the Landsat images. The results indicated that the mean surface temperature for areas cover by urban area increased from 33.25°C to 34.11°C between 1990 and 1999, while the mean temperature for areas covered by vegetation decreased from 25.31°C to 24.68°C. similarly areas covered by open space increased from 28.36°C to 28.47°C while areas covers by water body decreased from 25.16°C to 25.06°C, bringing the overall mean surface temperature between 1990 and 1999 from 30.2°C to 31.01°C. Between 1999 and 2008, the mean surface temperature for areas cover by urban area increased further from 34.11°C to 34.31°C while the mean temperature for areas covered by vegetation increased from 24.68°C to 24.76°C. Areas covered by open space decreased from 28.47°C to 27.85°C while areas covers by water body decreased from 25.06°C to 24.99°C, bringing the overall mean surface temperature between 1999 and 2008 from 31.01°C to 31.21°C. Then in the final epoch between 2008 and 2017 the mean surface temperature for areas cover by urban area increased further from 34.52°C to 35.96°C while the mean temperature for areas covered by vegetation increased from 24.76°C to 25.50°C. Areas covered by open space increased from 28.77°C to 30.08°C while areas covers by water body increased from 24.99°C to 24.74°C, bringing the overall mean surface temperature between 2008 and 2017 from 31.21°C to 31.82°C. this indicated a steady increase of urban area temperature between 1990 and 2017. To affirm the results, correlation coefficient was conducted and it gave a

Evaluation of the Effect of Landuse Growth on Land Surface Temperature Using Remote Sensing; a Case Study of Awka Capital Territory, Nigeria. (10287)

Joel Igbokwe, Esomchukwu Igbokwe, Nkechi Baywood and Uchenna Duru (Nigeria)

FIG Working Week 2020

Smart surveyors for land and water management

Amsterdam, the Netherlands, 10–14 May 2020

coefficient of 0.925 between LST and urban area, 0.730 between LST and open space and -0.22 and -0.73 between LST and vegetation and LST and water body respectively. The results obtained is significant as it can be used as a decision support system for Environmental planning and management in Awka Capital Territory

Evaluation of the Effect of Landuse Growth on Land Surface Temperature Using Remote Sensing; a Case Study of Awka Capital Territory, Nigeria. (10287)

Joel Igbokwe, Esomchukwu Igbokwe, Nkechi Baywood and Uchenna Duru (Nigeria)

FIG Working Week 2020

Smart surveyors for land and water management

Amsterdam, the Netherlands, 10–14 May 2020