Development of Method for LST (Land Surface Temperature) Detection Using Big Data of Landsat TM Images and AWS

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Worldwide climate change phenomena and rapid industrialization caused serious environmental problem. One of the major implications of urbanization is increase of surface temperature and development of Urban Heat Island. Surface temperature is increased by anthropogenic heat discharges due to energy consumption, increased land surface coverage by artificial materials having high heat capacities and conductivities, and the associated decrease in vegetation and water pervious surfaces which reduce the surface temperature through evapotranspiration. Landsat ETM images are widely used to observe and model the biophysical characteristics of the land surface. In addition to the development of Land use/cover maps band 6 of the Landsat imagery is useful for deriving the surface temperature. In this paper we analyze the results of the LST estimation from landsat data and discuss the associates constraints and challenges.

In this study, land surface temperature derived from Landsat TM satellite imagery (145 scenes) and meteorological data observed at the Automatic Weather Observation (AWS) from 1984-2009 were used as input variables for the evaluation of LST in Seoul City, Korea. For the landsat images data and AWS date where link and pre-processing such as geometric correction was performed. AWS observed surface heat converted data correlated with temperature and atmospheric temperature and wind direction, humidity, sea level pressure, and multiple regression analysis obtained by setting the interval of highly variable surface temperature with landsat images correlation analysis was performed.

For accurate indicator analysis NASA model was utilized to extract the surface heat. This research is to analyze and identify the correlation between the surface temperature and the linear equations obtain to calculate the correction factor to develop a model for LST in Korea. The results of this study will contribute to the strategies necessary for the sustainable management in urban revitalization planning in the future.