# Analysis of Land Surface Temperature Retrieved from High Resolution Satellites in Seoul, South Korea

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In order to analyze the land surface properties in Seoul and its surrounding metropolitan area in the South Korea, several indices and LST were calculated by the Landsat 8 and TERRA and AQUA MODIS satellites. The land surface properties used are the indices that represented Soil Adjusted Vegetation Index (SAVI), Modified Normalized Difference Wetness Index (MNDWI), Normalized Difference Wetness Index (NDWI), Tasseled cap Brightness, Tasseled cap Greenness, Tasseled cap Wetness Index, Normalized Difference Vegetation Index (NDVI) and Normalized Difference Built-up Index (NDBI) and the LST of the area in and around Seoul. Most indices distinguish very well between urban, rural, mountain, building, river and road. In particular, most of the urbanization is represented in the new cities around Seoul.

According to NDVI, NDBI and LST, urban expansion is displayed in the surrounding area of Seoul. The LST and surface elevation have a strong relationship with the distribution and structure of the vegetation/built-up indices such as NDVI and NDBI. While the NDVI is positively correlated with the LST and is also negatively correlated with the surface elevation, the NDBI have just the opposite correlations, respectively.

In addition, in order to investigate the thermal properties in metropolitan, Landsat and MODIS land surface temperature, AWS (Automatic Weather Station) temperature, digital elevation model and landuse are used. Analysis method among the Landsat and MODIS LST and AWS temperature is basic statistics using by correlation coefficient, root-mean-square error (RMSE) and linear regression function etc.

As a result, statistics of Landsat and MODIS LST are a correlation coefficient of 0.32 and RMSE of 4.61K, respectively. And statistics of Landsat and MODIS LST and AWS temperature have the correlations of 0.83 and 0.96 and the RMSE of 3.28K and 2.25K, respectively. Landsat and MODIS LST have relatively high correlation with AWS temperature, and the slope of the linear regression function have 0.45(Landsat) and 1.02(MODIS), respectively. Especially, Landsat 5 has lower correlation about 0.5 or less in entire station, but Landsat 8 has a higher correlation of 0.5 or more despite of lower match point than other satellites. Landsat 8 has highly correlation of more than 0.8 in the center of Seoul.