

Estimating of Electric Power Consumption by Mean of DMSP/OLS Nighttime Imagery in the East Asia

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This study aims at estimating the amount of electric power consumption from the intensity of the DMSP/OLS image. There appear several factors which could influence the image, e.g. the electric lights from the high-population areas, the sun and moon lights, and the lights from forest fires. We apply the noise reduction filter (NRF) and the high-pass filter to the daily DMSP/OLS data over both China and Japan for 1999. After applying the filters, light intensities are integrated over administrative boundaries called provinces in China and prefectures in Japan. Significant correlations between the integrated amount of light intensities and electric consumptions are found for both China and Japan ($R=0.80$ with $n=34$ and $R=0.82$ with $n=43$, respectively). The results suggest a potential use of the DMSP/OLS image to estimate the amount of electric power consumption for a regional scale.