Evaluation of Monitoring Frequency in Land Use Change Detection

*YUCHEN YEH¹, YAWEN LIN¹, CHIFARN CHEN¹

1. Center for Space and Remote Sensing Research, National Central University

Because the limited slop-land resources have been excessively exploited in Taiwan, the government has developed a large-scale land use change detection program since 1996. This program aims to assist slop-land management using multi-temporal satellite images to regularly discover suspicious illegal land use changes. Firstly, the change detected by satellite images are dispatched to relevant agencies. Secondly, agencies will then perform onsite inspections to verify the legality of land use. At the beginning of the program, the monitoring frequency is irregular. However, the program regularly monitors and detects land use changes every two months since 2014. Then the monitoring frequency is adjusted to every month since 2018. In order to evaluate the effect of the monitoring frequency, this study uses two different monitoring frequency to perform the evaluation. For comparison, we collected 845 illegal change areas from bimonthly monitoring frequency in 2017 and 1,787 illegal change areas from monthly monitoring frequency in 2018 for evaluation respectively. The result showed the more illegal land use changes can be early detected. Specifically, we adopted Kernel Density Estimation (KDE) to compare the area of illegal land use changes. The distribution of area in monthly monitoring frequency exhibited a centering under 500 m²; in contrast, for bimonthly monitoring frequency, the distribution of area majorly concentrates over 1,000 m². The comparison indicated that the monthly monitoring is able to detect the land use changes at the beginning of land development excessively. As a result, the governments can curb the extension of violations area in advance, decrease the damage of land development by offenders and recover the damaged land rapidly.

Keywords: Land Use Change Detection, Monitoring Frequency