# Statistical significance of landcover change detection using multitemporal satellite images

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Landcover change detection using remote sensing images is a powerful tool for watershed management. Determination of threshold of gray level difference for change detection is essential for such practices. In addition, accuracy assessment for change detection results is particularly difficult due to lack of ground-truth landcover data of pre- and post-periods.

Therefore, a probabilistic approach based on test of hypothesis for landcover change detection was developed in this study. Assuming the digital numbers are bivariate normal distribution. It provides a confidence level for deciding a pixel is changed or not, which can be an alternative to the producer's accuracy achieved by post-classification change detection approach. Instead of using a not so meaningful threshold, we provide a statistical confidence level to explain how much confidence we have when some pixels are detected as changed pixels. In the study area in central Taiwan, the major change is from vegetation to bare soil/ built-up. The change areas detected by 5% significance contribute 7.05% of this entire area.