

## Satellite-Based Modeling of *Anopheles* Mosquito Densities on Heterogeneous Land Cover in Western Thailand

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### Abstract

Landsat 5 TM was used as a tool to model *Anopheles* mosquito densities on heterogeneous land cover. In this study, mosquito density data was divided into five classes; absence, low, moderate, high, and very high densities. Land cover was classified into eight types. Stagnant water, wetland, and paddy land cover types are larva habitat. Forest, cropland, orchard, and grassland land cover types are adult habitat. Built-up land is non habitat. Multiple linear regression and discriminant analysis were selected to identify the relationship between mosquito densities and land cover types. For the average flight range of mosquitoes, 1000, 2000, and 3000 meters buffer were used as the sample zones around the collected points to test the relationship between them. The results revealed that discriminant analysis is the best statistical model for fitting the model. The mosquito flight range of 1000, 2000, and 3000 meters were predicted with accuracies up to 80%, followed by 74.3%, and 54.3%, respectively. Relationships between mosquito density and heterogeneous land cover in this study appear to be varied upon forest, grassland, and larva habitat within the 1000 meters buffer, likewise, forest, and larva habitat within 2000 meters buffer.

### Keywords

*Anopheles* mosquito densities, Landsat5 TM, land cover classification, mosquito life cycle, statistical model

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