

Sukee Boonsang 2011: Estimation of Above - ground Carbon Sequestration of Forest Area by Using Remote Sensing Techniques at Mae Tuen Wildlife Sanctuary, Tak Province. Master of Science (Forest Resource and Environmental Administration), Major Field: Forest Resource and Environmental Administration, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor Wanchai Arunpraparut, D.Agr. 85 pages.

This study was aimed to estimate the above-ground carbon sequestration of forest area by using remote sensing techniques at Mae Tuen Wildlife Sanctuary, Tak Province. It concerns, the relationship between above-ground carbon sequestration and the reflectance value of different wavebands of LANDSAT 5 TM image of the year 2007, including band 2 (Green), band 3 (Red) and band 4 (IR) were analyzed. It included well-known vegetation indices; simple subtraction (IR-R), simple ratio (IR/R), normalized difference vegetation index (NDVI), transformed vegetation index (TVI) and green vegetation index (GVI). The Regression analysis was employed to determine the relationships between those parameters and carbon sequestration in order to perform the best-fit model for estimating the above-ground carbon sequestration of each forest types at Mae Tuen Wildlife Sanctuary, Tak Province.

Based on the present study, the best fit-model of each forest types at Mae Tuen Wildlife Sanctuary, Tak Province was formulated. The best-fit model for estimation above-ground carbon sequestration (CS) of dry evergreen forest was $CS = 630.339(R) - 74.019$ with the coefficient of determination (R^2) of 0.839. While the best fit-model for hill evergreen forest, mixed deciduous forest, and dry dipterocarp were CS for hill evergreen = $327.630(IR) - 27.974(IR/R) - 36.188$ with $R^2 = 0.854$; CS for mixed deciduous = $951.608(IR-R) - 505.367(IR) - 62.406(IR/R) + 134.572$, with $R^2 = 0.741$; and CS for dry dipterocarp = $53.140(IR) - 41.031(TVI) - 194.004(G) + 59.783$, with $R^2 = 0.745$, respectively. The estimation of above-ground carbon sequestration of Mae Tuen Wildlife Sanctuary in the year 2007 was 8,886,516.9 ton-carbon. The rate of above-ground carbon sequestration of each forest types was different. The results showed that the maximum rate of above-ground carbon sequestration was found in dry evergreen forest and followed with hill evergreen forest, mixed deciduous forest, and dry dipterocarp forest, respectively. (129, 102.43, 80.16, and 54.68 ton-carbon per hectare)

Student's signature

Thesis Advisor's signature