Abstract

The comparison of efficiencies of simple box and ISCST3 air quality models on prediction of PM-10 concentrations according to open burning, a case study of Khonkaen province in 2008-2009. The comparison between Simple Box Model and ISCST3 air quality model on open burning particulate matter concentration by using Linear regression. The input sources data started from the Moderate Resolution Imaging Spectroradiometer (MODIS) provided by the Department of National Parks, Wildlife and Plant Conservation. PM-10 emitted from open burning were calculated according with emission factors developed by the United State Environmental Protection Agency (US.EPA.). The cocentrations of PM-10 were predicted using ISCST3 and Simple Box Model with and without considering wind directions. The result found that, values calculated by simple box model without concerning with wind direction predicted the highest correlation with the measured data. The model explained the actual monitored values about 17.47% while the simple box model with wind direction concerning explained about 10.71% and ISCST3 Air Quality Model explained about 12.85%. From the result of study that the Simple Box Model without concerning wind direction showed the highest effeciency on the prediction of PM-10 according to open burning, an equation from the relation was developed to be used as a tool to manage the concentrations of PM-10 to below the Ambient Air Quality Standard by limiting open burning areas. The equation is:

$$\text{The Maximun Open Burning Area (rais/day)} = (\text{Wind Speed, m/s}) \times (\text{Mixing Height, m}) \times \left(0.748 - \frac{\text{Conc.PM - 10 of the previous day, } \mu\text{g/m}^3}{160.42} \right)$$