

Tropospheric ozone trend in the Muda irrigation area, Kedah.

ABSTRACT

The ozone trend in the Muda Irrigation Area (MADA), Kedah, Malaysia, was assessed from the ozone data recorded in Sungai Petani. Three parameters were selected as the robust trend indicators in the study: the monthly mean, the monthly averaged daily 1-h maximum and the number of annual hours $> 120 \text{ g/m}^3$. As the ozone data displayed obvious seasonal variation, using deseasonalised monthly average parameters to estimate the ozone trends could smooth out the influence of seasonal fluctuations. In this study, we used the Box-Jenkins methodology to build the Auto-Regressive Integrated Moving Average (ARIMA) model for the monthly ozone data taken from an Automatic Air Quality Monitoring System in Sungai Petani station for the period between 1999 and 2007, with a total 108 readings. The parametric, seasonally adjusted ARIMA (1, 0, 1) x (2, 1, 2)₁₂ model was successfully applied to predict the long-term trend of ozone concentration. The detection of a steady, statistically significant upward trend of ozone concentration in the area is a concern for human health and agricultural activities.

Keyword: Tropospheric ozone; Time series analysis; Seasonal variation; MADA area.