Optimization of remote meteorological parameters in predicting the air pollutant (NO2) distribution by Petrochemical Industry along Coastal Zone at East Coast of Peninsular Malaysia.

ABSTRACT

As commonly observed throughout the world, the meteorological parameters at coastal area are influenced by both rotation of wind direction and sea breezes wind vectors features. Theoretically, this atmospheric condition describes difficulties in predicting on ground concentration of pollutant using the acceptable method of dispersion under the turbulence properties. This research applies the air dispersion modeling using ISCT3 software in order to predict on ground concentration of NO2 from selected petrochemical plants in Kertih, Terengganu, located at North East of Peninsular Malaysia Meteorological data of year 2008 obtained from the Kuala Terengganu Meteorology Station was used as input to the ISCT3 software. This meteorology station is located approximately 95 km north-west off the study site which contains the pollutant sources and verification point. The modeling domains covered a 20 x 20 km2 area centre of the petrochemical industry with grid spacing of 500 meter each as dummy receptors. During verification process, the significance improvement through the optimization analysis of wind direction proven that the correlation coefficient of predicted over the actual NO2 concentration improve from 0.68 to 0.91. The average maximum monthly and yearly on ground concentration NO2 obtained is at 13.97 ug/m3 and 6.91 ug/m3 respectively. The annual value is much below the Malaysian and WHO guidelines which is at 90 ug/m3 and 40 ug/m3 respectively. No benchmarking could be gauged on the monthly value since no guideline is available.