Topic: Spatial Information and Analysis

GIS Based Spatial Analysis of Air Pollution at Near Roadways in Makassar City

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Abstract. Makassar is one of the big cities in Indonesia included in the ASEAN Smart Cities Network (ASCN) initiative with the objective of delivering improved quality of life through infrastructure, a clean and sustainable environment. However, their rapid and unprecedented growth has also brought environmental challenges, including environmental degradation associated with air pollution due to motorized vehicles. About 60-70%, the source of air pollution in Indonesia is emissions from motorized vehicles. According to the statistical office of South Sulawesi province, in Makassar city, there are 1,337,738 vehicles in 2015 and 1,574,385 vehicles in 2018, an increase of more than 5% annually. This shows that indirectly air pollution in Makassar city will increase along with the increase in the number of motorized vehicles. The effect of air pollutant load caused by motorized vehicles is the main source of CO and NO2. Therefore, it is necessary to conduct a preliminary study to spatially analyze the concentration of CO and NO2 and to estimate the dispersion of pollutants around highways in the ambient air around the Makassar city based on the condition of the volume of vehicles in the field. In this paper, pollutant concentrations are analyzed at receptor points along several roads using CALINE 4. Characteristics of air pollution distribution are then analyzed by the Geographic Information System (GIS) to assess the dispersion of pollutants, etc. for near roadways. The road network which contains several roads has varying emission characteristics and pollution concentrations that give base information for the strategy of controlling quality air in future.