SPATIO TEMPORAL CHANGES OF PARTICULATE MATTER 2.5 (PM2.5) AIR POLLUTION AND WIND DIRECTION ANALYSIS IN PENINSULAR MALAYSIA USING GIS

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Air pollution is the biggest environmental health issue in the world and a key contributor to early death and disease. Exposure to fine particulate matter having an aerodynamic diameter of 2.5 um or less (PM2.5) in a cubic meter of air ($\mu g/m^3$) was used to measure ambient particulate matter pollution. PM2.5 is used as an indicator of ambient particulate matter pollution in this study because it has the strongest relationship with disease burden and mortality. Aside from that, PM2.5 is frequently used in air quality monitoring as an indicator of changes in air quality. The fate of air pollutants is influenced by air movement. If the air is calm and pollutants are unable to disperse, the concentration of these pollutants will rise. Pollutants, on the other hand, disperse quickly when strong, turbulent winds blow, resulting in lower pollutant concentrations. Many studies on air pollution have been conducted, but there are fewer studies in Malaysia that investigate the effect of wind direction on air pollution. As a result, this study suggests that the relationship between wind direction and air pollution be investigated further. The goal of this study is to analyze the spatio temporal of air pollution and wind direction in Peninsular Malaysia in 2019, 2020 and 2021 using ArcGIS. The objectives of this study are as follows: (i) to identify data layer suitable for air pollution analysis, (ii) to show the distribution of PM2.5 air pollution station and wind direction for Peninsular Malaysia in within 2019 to 2021, (iii) to analyze the relationship of air pollution and wind direction in each year of study at the study area. The IDW and Fishnet method was used to produce map which is Map of Air Quality Monitoring Station in Peninsular Malaysia, Map of Road Network in Peninsular Malaysia, Map of Wind Direction Over Peninsular Malaysia, Comparison Map of Air Pollution Level with Road Network, Map of Air Pollution and Wind Direction During Southwest Monsoon and Map of Air Pollution and Wind Direction During Northeast Monsoon. Then analysis was performed based on the map.

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