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GIS-BASED MAPPING AND STATISTICAL ANALYSIS OF ATMOSPHERIC POLLUTION IN PORT
HARCOURT, SOUTHERN NIGERIA**Abstract**

It was discovered that it is difficult to achieve cooperation for air pollution control in developing countries like Nigeria whose main concern is to provide the basic needs as food, shelter and employment for her populace. Moreover, the control measures adopted have not been very effective and fully enforced (Suleiman, 2013). It is based on the above fact that this study focuses on mapping of the spatial distribution of air pollutants within Port Harcourt Metropolis. This study goes further to propose some preventive and monitoring measures utilizing Geographic Information System (GIS) as an analysis tool. The research focused on spatial variation and distribution of air pollutants in Port Harcourt city. The main objectives of this study was to analyze the level of atmospheric pollutants in parts of Port Harcourt metropolis and to evaluate the temporal variation of atmospheric pollution in the study locations. A correlation test was performed to establish the relationship between each air quality parameter within Port Harcourt Metropolis. GIS was utilized to investigate the spatial distribution of the air pollutants. The main finding of this research is the comparison between spatial and non-spatial (statistical) analysis approaches, which indicated that correlation analysis and spatial interpolation analysis of GIS using the average levels of air pollutants from a single monitoring station or by group of few monitoring stations is a relatively efficient method for comparing the health effects of air pollution in emerging locations of under-developing cities. There was a significant positive correlation between variable under consideration, and the research shows an increasing trend of concentration of pollutants in maps which was used to confirm the depleting air quality in Rumokoro, Garrison and Mile 1 areas of Port Harcourt. A non-spatial approach alone may be insufficient for an appropriate evaluation of the impact of air pollutant variables and their inter-relationships and spatial distribution within cities. It is important to evaluate the spatial features of air pollutants before modeling the air pollution-health relationships. Hence, this air quality maps could play a vital role in the decision making process for air pollution monitoring strategies and policies.

KEY WORDS GIS, GPS, Buffer Analysis, Spatial Analysis, Spatial Interpolation, Correlation Analysis, Air pollution, Vehicular Pollution.