Accepted Manuscript

Spatial statistics, spatial correlation and spatial graph theory in air pollution

Sneha Gautam, Jaydev Teraiya, Aditya Kuma Patra

PII: S2352-1864(18)30142-1
DOI: https://doi.org/10.1016/j.eti.2018.07.002
Reference: ETI 256

To appear in: *Environmental Technology & Innovation*

Received date : 25 March 2018
Revised date : 22 May 2018
Accepted date : 15 July 2018

Please cite this article as: Gautam S., Teraiya J., Patra A.K., Spatial statistics, spatial correlation and spatial graph theory in air pollution. *Environmental Technology & Innovation* (2018), https://doi.org/10.1016/j.eti.2018.07.002

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Spatial statistics, spatial correlation and spatial graph theory in air pollution

Sneha Gautam[1,3*], Jaydev Teraiya[2], Aditya Kuma Patra[3]

[1]Department of Environmental Science and Engineering, Marwadi Education Foundation's Group of Institutions, Rajkot 360003, India

[2]Department of Mathematics, Marwadi Education Foundation's Group of Institutions, Rajkot 360003, India

[2]Department of Mining Engineering, Indian Institute of Technology, Kharagpur 721302, India

[*] Corresponding Author Email: gautamsneha@gmail.com
Phone: +91 9131085801

Abstract

The aim of the study is to estimate the particle concentration variation across different working levels inside an opencast mine. The study was conducted in one of the deep opencast copper mines in India to estimate the distribution of different size of particles emitted from the operations concentrated in deeper parts of the mine. Moreover, with advancement of SPSS (version 25), the analytical techniques were used to identify the exposure to different size of particle during mining operations. We introduced the spatial statistic and graph theory in the field of air pollution to understand the particle distribution. The combination of correlation and one – way ANOVA statistical methods were used to estimate the impact of depth of mine as a critical factor on distribution of particle concentration. The outcomes of the study shows that spatial statistics, correlation, one – way ANOVA and graph theory can be used to understand the distribution pattern (shortest route to travel), to estimate concentration at different level, and to better understand mine workers exposure to particle matter.

Keywords: Particulate matter; Opencast mine; Personal exposure; Statistics; Graph theory

Download English Version:

https://daneshyari.com/en/article/8857941

Download Persian Version:

https://daneshyari.com/article/8857941

Daneshyari.com