

A high-resolution estimation of the PM2.5 distribution by the R and the GIS applications

OMORI, Akiho¹ ; YAMAKAWA, Junji^{1*}

¹Graduate School of Natural Science and Technology, Okayama University

A relatively high precision and high resolution spatial distribution of the PM2.5 in the south part of the Okayama prefecture, Japan was estimated by the Universal Kriging method and the FOSS4G GIS softwares. The observation data of the PM2.5 were obtained from the Environmental data service site of the Okayama prefecture. The geospatial open data about the research field that used in the research were served by the government research institutes. The spatial analysis were executed by the R (R core team, 2014) and its spatial libraries, maptools (Bivand and Lewin-Koh, 2014), rgdal (Bivand, Keitt and Rowlingson, 2014) and gstat (Pebesma, 2014). The geospatial representation and qualitative analysis of the estimated distribution were performed by the QGIS (QGIS Development Team, 2014) and the Google earth (Google, 2015). The time variant of the PM2.5 concentration by the each observatories in the area were show some correlation to the SPM10 concentration data. The estimated PM2.5 distribution seems to show that the relatively tight relation to the geospatial factors in the research area. The estimation of a time variant change of the PM2.5 distribution will be required of the further research.

Keywords: PM2.5, Spatial statistics, Kriging, R-language, gstat, FOSS4G