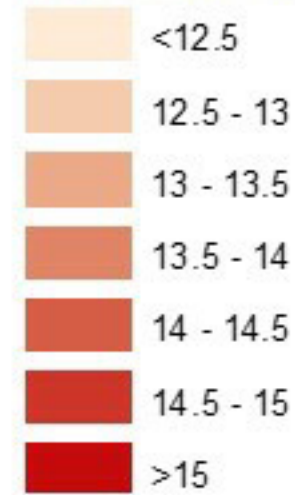


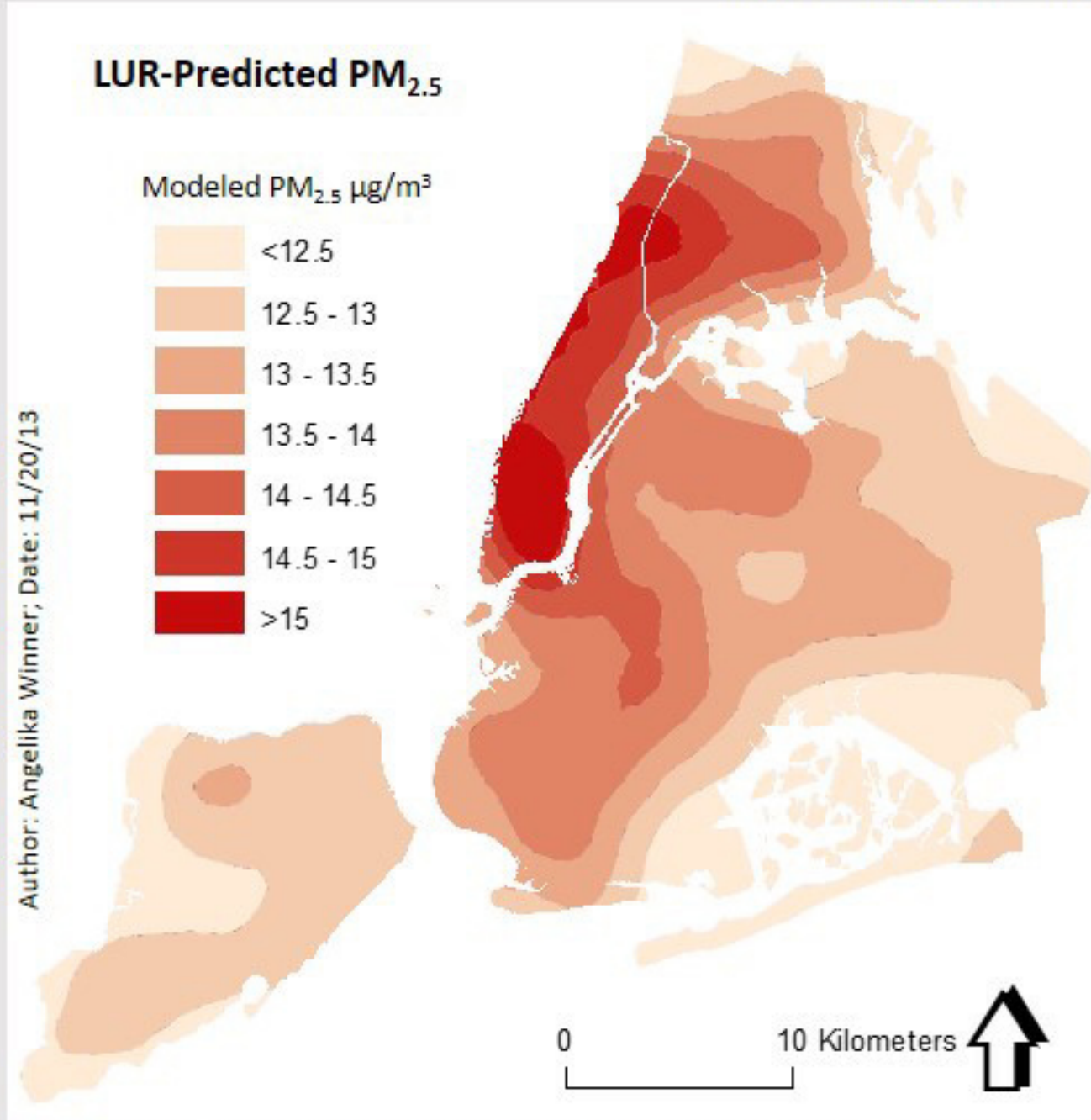
Modelling of Fine Particulate Matter in New York City

LUR-Predicted PM_{2.5}

Modeled PM_{2.5} µg/m³



Author: Angelika Winner; Date: 11/20/13



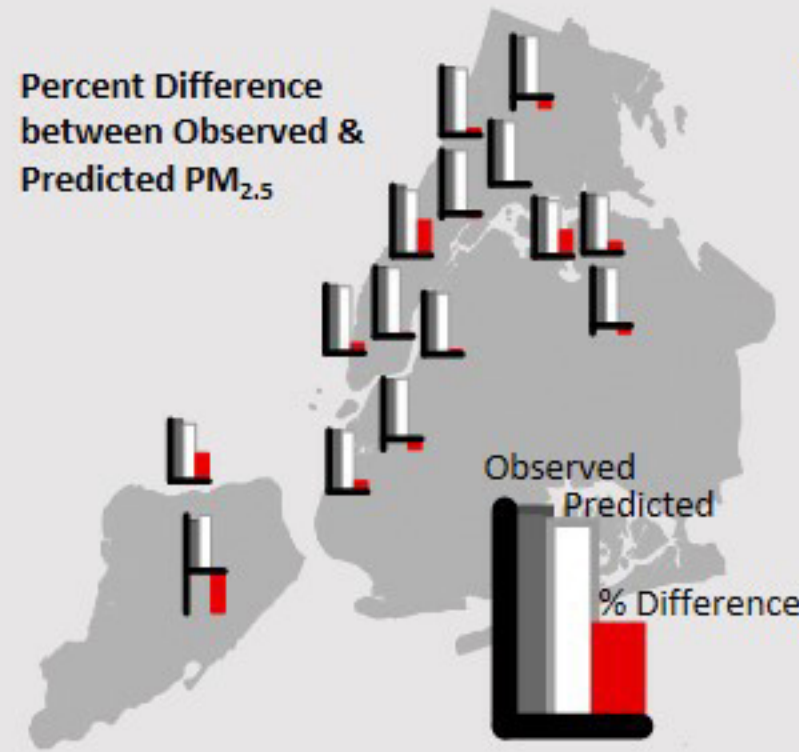
Objective: Estimation of the average annual concentration of fine particulate matter (PM_{2.5}) in New York City with a Land-Use-Regression (LUR) model.

Data: EPA air quality monitor data 2002 (n=15)

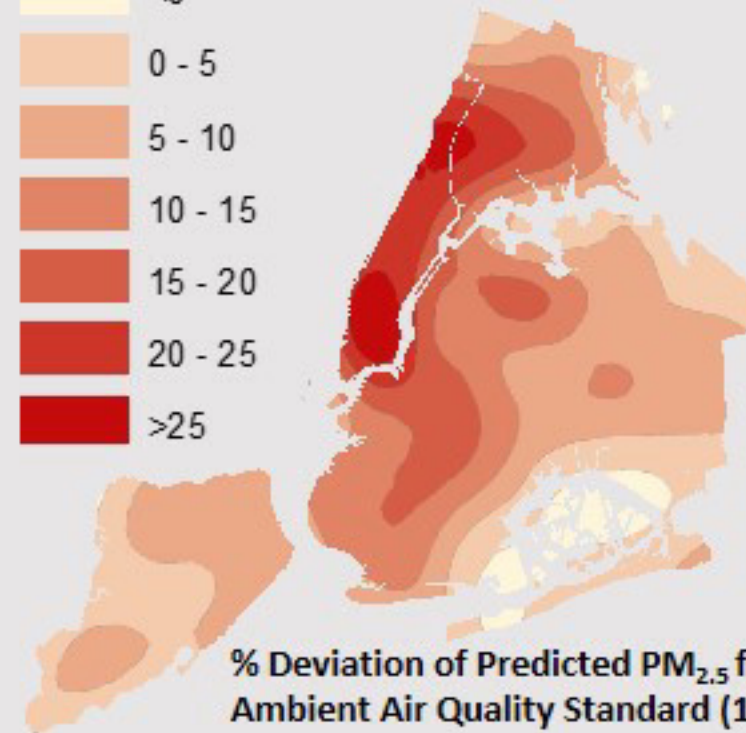
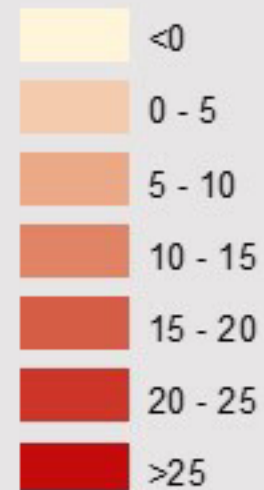
Methods: Since the length of major truck routes (MTR) and population density within 1000m from the monitor site are highly correlated to PM_{2.5} concentrations these variables were used to estimate PM_{2.5} with a Land-Use-Regression (LUR). The model was calibrated using the EPA air monitor data. A PM_{2.5} surface was interpolated utilizing Kriging which proved to be the interpolation method with the lowest mean-square error.

Results: The LUR Model was overall significant with an adjusted-R² of 0.87.

Percent Difference between Observed & Predicted PM_{2.5}



% Deviation from NAAQS



% Deviation of Predicted PM_{2.5} from National Ambient Air Quality Standard (15µg/m³)

Land-Use-Regression Equation

$$PM_{2.5} = 11.837829 + 0.000102 * MTR_LEN + 0.000085 * POP_DENS$$

With:

PM_{2.5} = simulated concentration of fine particulate matter

MTR = length of major truck routes within 1000m

POP_DENS = population density of census blocks within 1000m

Population Density, Major Truck Routes & Measured PM_{2.5}

