Winds of Change in the City of Destiny: Modeling Air Pollution Exposure Risk in Urban Environments

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Urban air quality is a persistent problem that affects community members at all levels. The World Health Organization (2016) characterizes poor air quality as one of the most pervasive anthropogenic effects of climate change on humans as a whole, killing around 4.2 million people per year. The goal of this study was to empower community scientists to advocate for environmental justice within their own communities. By using an online teaching component, that can be found at https://arcg.is/1yLqfv0, this study leveraged the power of spatial technologies to model localized air quality in urban environments. By determining areas of increased exposure risk, remediation and public messaging can be more effectively applied. This study identified four metrics that impacted local air pollution the most: road density, population density, construction density, and proximity to EPA Superfund sites (both current and past). A model crafted from these factors was hypothesized to predict areas of poor air quality. This model was tested using field data in Chicago, Il and Tacoma, WA. While the model accurately predicted areas of poorest air quality in both cities, it lacked precision when extrapolated to larger cities like Chicago.