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Environmental Justice in MA: An Analysis of Income Levels and Hazardous Waste Sites

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Abstract and Source of Data: It is commonly believed that hazardous waste sites are more likely to be found in low income level neighborhoods, as opposed to high income level neighborhoods. I sought out to quantify this belief by performing a simple analysis in ArcGIS, by seeing if there are indeed more hazardous waste sites located in low-income level areas than high-income level areas. In order to perform this analysis, 5 year average (2008-2013) census tract data for Massachusetts was downloaded from the American Community Survey website, to obtain the median household income (inflation-adjusted) by census tract. In addition, three categories of hazardous waste sites: Tier Classified Sites, AUL Sites, and the BWP Major facilities datalayers, were downloaded from the MassGIS website. Tier Classified Sites are contaminated real estate sites in Massachusetts where cleanup actions are ongoing. AUL (Activity and Use Limitation) sites are sites where cleanup actions were completed but contamination still remains at the site, so they now have a land-use limitation. BWP Major Facilities are facilities registered with the MA Bureau of Waste Prevention, and include hazardous waste generators, recyclers, storage facilities, and facilities with air and/or groundwater discharge permits. Some sites may be in several of the data layers, so each hazardous waste data layer was examined separately. Both the total number of sites per income tract level and the number of sites per square mile by income tract level were found by using the "Select by Location" tool, calculated, and plotted on graphs. The total number of sites graphs indicate that the Low-Med and Medium income level tracts have the most total sites. The sites per square mile graphs show an enormous disparity between the Low income level tracts and the other income level tracts. It seems that the results for the Low-Med tracts may be distorted by the large areas of Low-Med tracts in western Massachusetts. Nevertheless, it is clear from this analysis that there are more hazardous waste sites per unit area in low income areas than in high income areas. This analysis does not show why this is the case, just that this phenomenon does indeed exist. Research is ongoing in the social sciences to determine exactly why there are many more hazardous waste sites in low income areas versus high income areas.

[Maps and graphs are provided to illustrate the findings.]

Graphs of Results: The graphs on the top show that the number of hazardous waste sites per tract type for all of Massachusetts is greatest for the Med-Low and Medium income tract levels. The graphs on the bottom show that there are 11 to 24 times as many sites per square mile in Low income tracts versus High income tracts.