

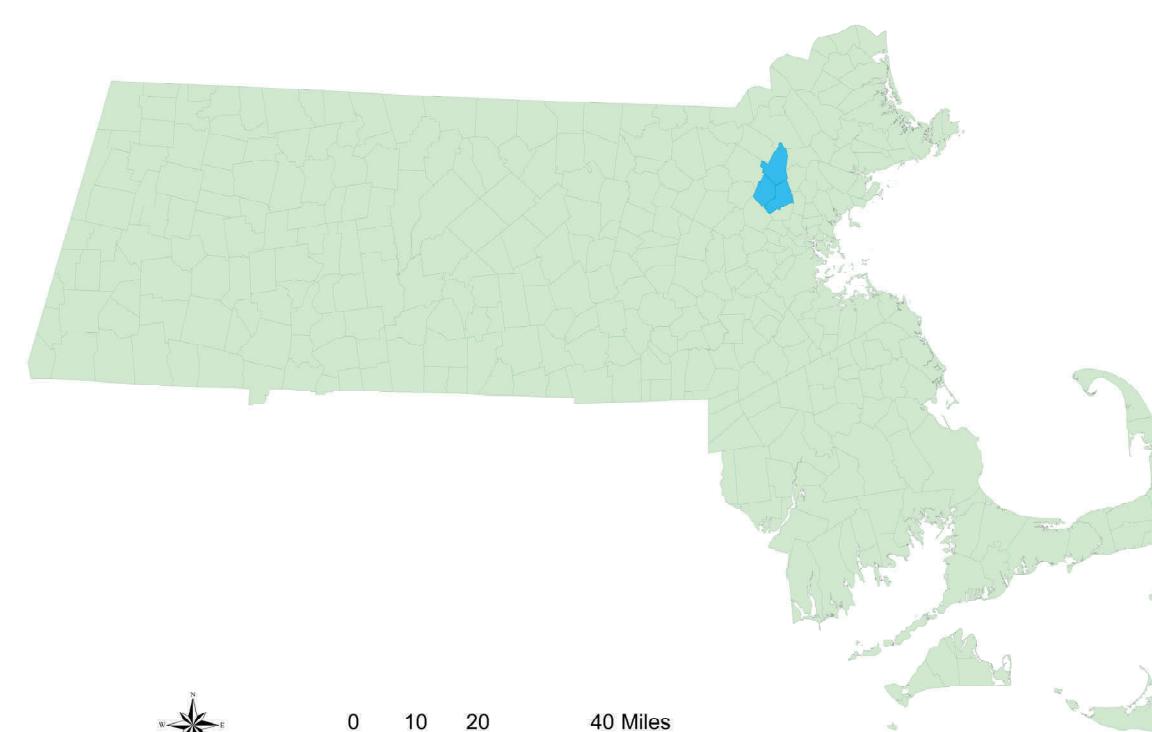
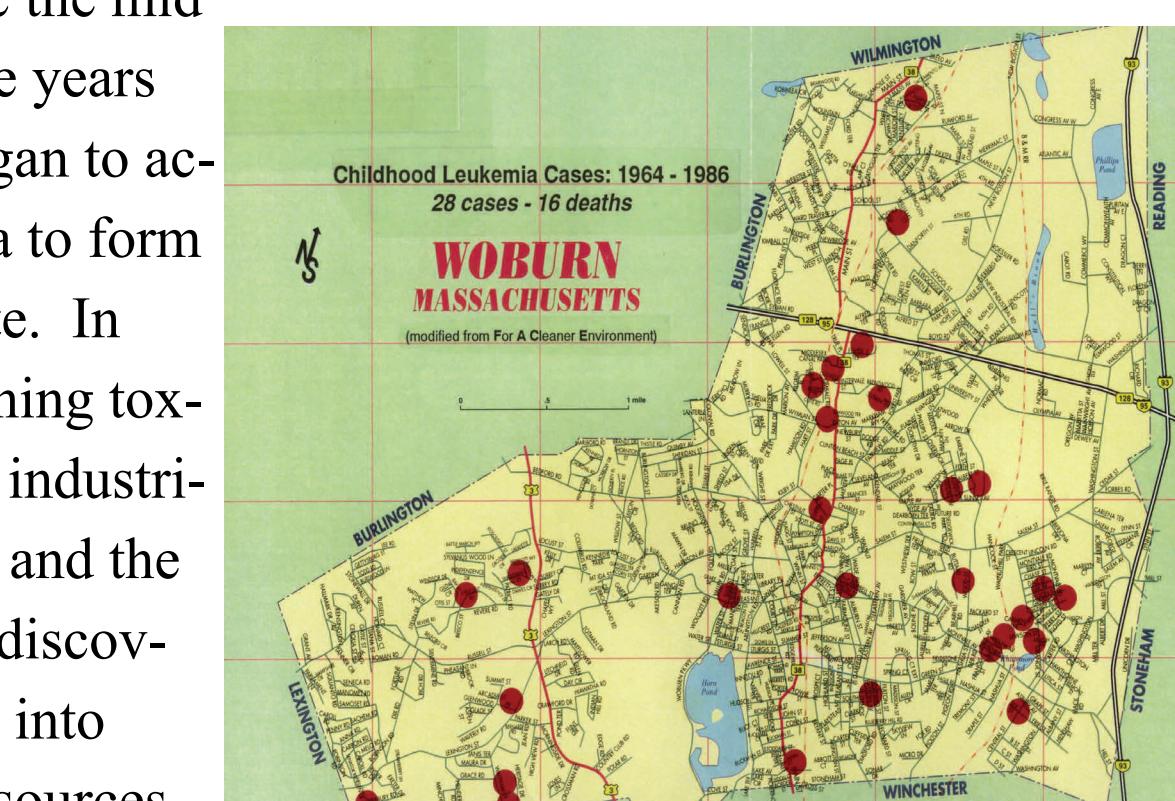
The Impacts of Superfund Sites: Environmental Justice in Woburn, MA and Neighboring Cities

Introduction

From the 1960s to the 1980s, the city of Woburn, MA was plunged into a dark period of environmental and medical unrest. The incidence of childhood leukemia skyrocketed, and contaminants were found in many of the wells in the area in 1979. In an article discussing the fallout from the environmental damage in Woburn, the city is described as “infamous for what the Center for Disease Control called ‘the most persistent leukemia cluster in the United States.’ From 1966 to 1986, 28 cases of childhood leukemia were reported in Woburn, while only six cases were expected” (Durant 93).

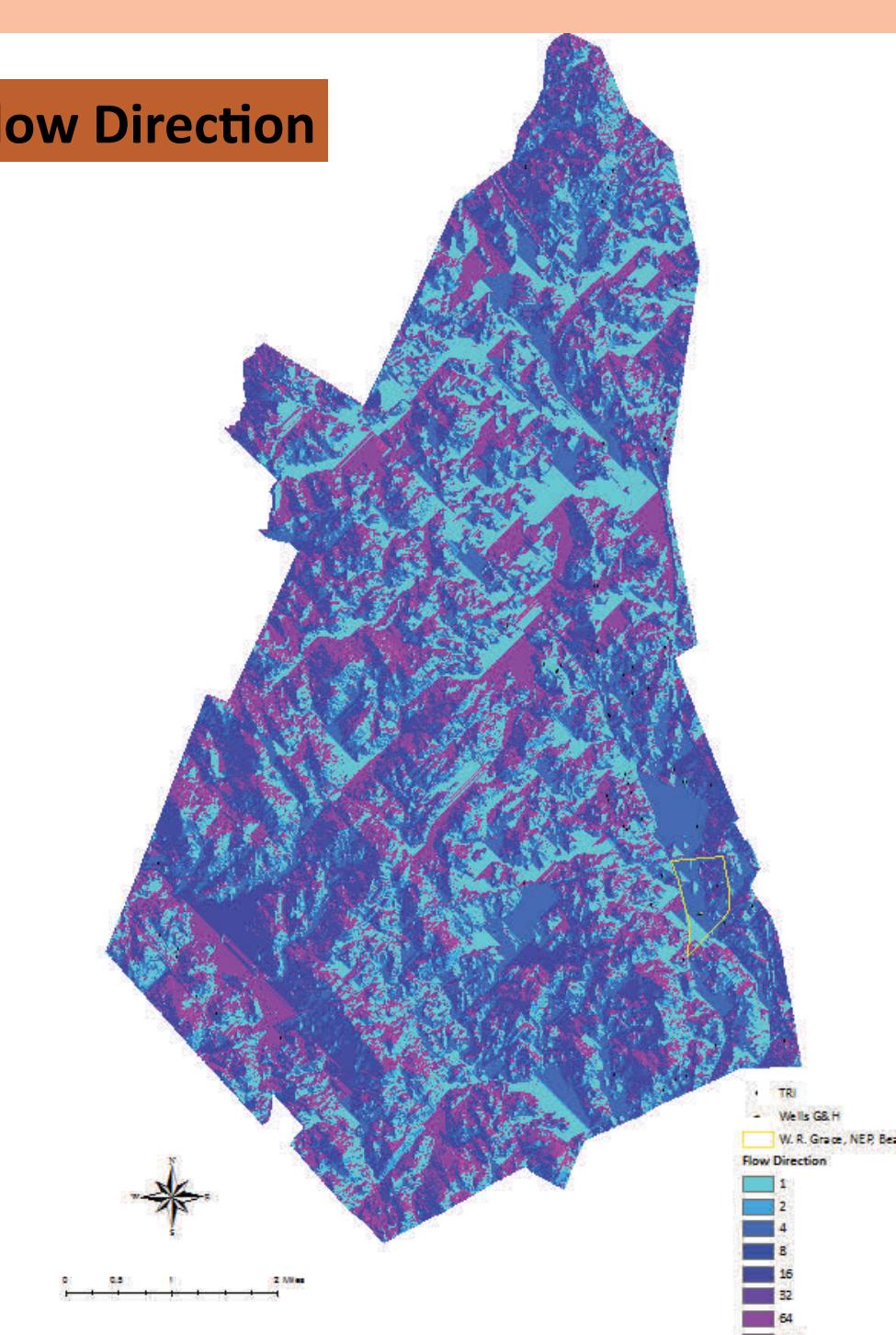
The contaminants leached into the groundwater from five sites, mainly W. R. Grace, NEP, and Beatrice Foods. Tanneries have been thriving in Woburn since the mid-1800s, and over the years industrial plants began to accumulate in the area to form the Industri-Plex site. In 1979, drums containing toxic waste from these industrial sites were found, and the contaminants were discovered to have seeped into wells G and H, the sources for 30% of the city’s water (epa.gov).

The Environmental Protection Agency declared a total of 330 acres a Superfund site and put measures in place to protect against further harm. The clean-up process has been underway since, but even today the sites in Woburn continue to be one of the most dangerously contaminated Superfund sites on the EPA’s watch list (epa.gov).



Methods

Flow Direction



Left: The groundwater from the area surrounding the toxic sites flows towards wells G&H in Woburn. Contaminants that leached into the groundwater from the industrial sites flowed into the wells, causing a contamination of the city’s drinking water.

Many sites in these three cities have been designated by the EPA as Toxic Release Inventory sites, or facilities that are required to inform the public about the toxic chemicals they use in their production processes (epa.gov/tri). TRIs surround the three superfund sites that are found in the area this project focuses on. Dangerous chemicals continue to be used in the area, and monitoring of the original contamination is still necessary.

After learning about the ongoing situation, I became curious about the population that continues to live in the area and the environmental justice they receive. The EPA defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (epa.gov). I studied the changes in minority population and income from 1990 to 2010 to understand how the continued toxicity of the land is affecting the community. Calculations from data downloaded from MassGIS and the American Census Bureau illustrated the changes in minority population and income in areas close to the sites.

Top Left: A map of the childhood leukemia cases in Woburn from 1964-1986.

Bottom Left: The cities of Woburn, Wilmington, and Burlington are located North of Boston in Massachusetts.

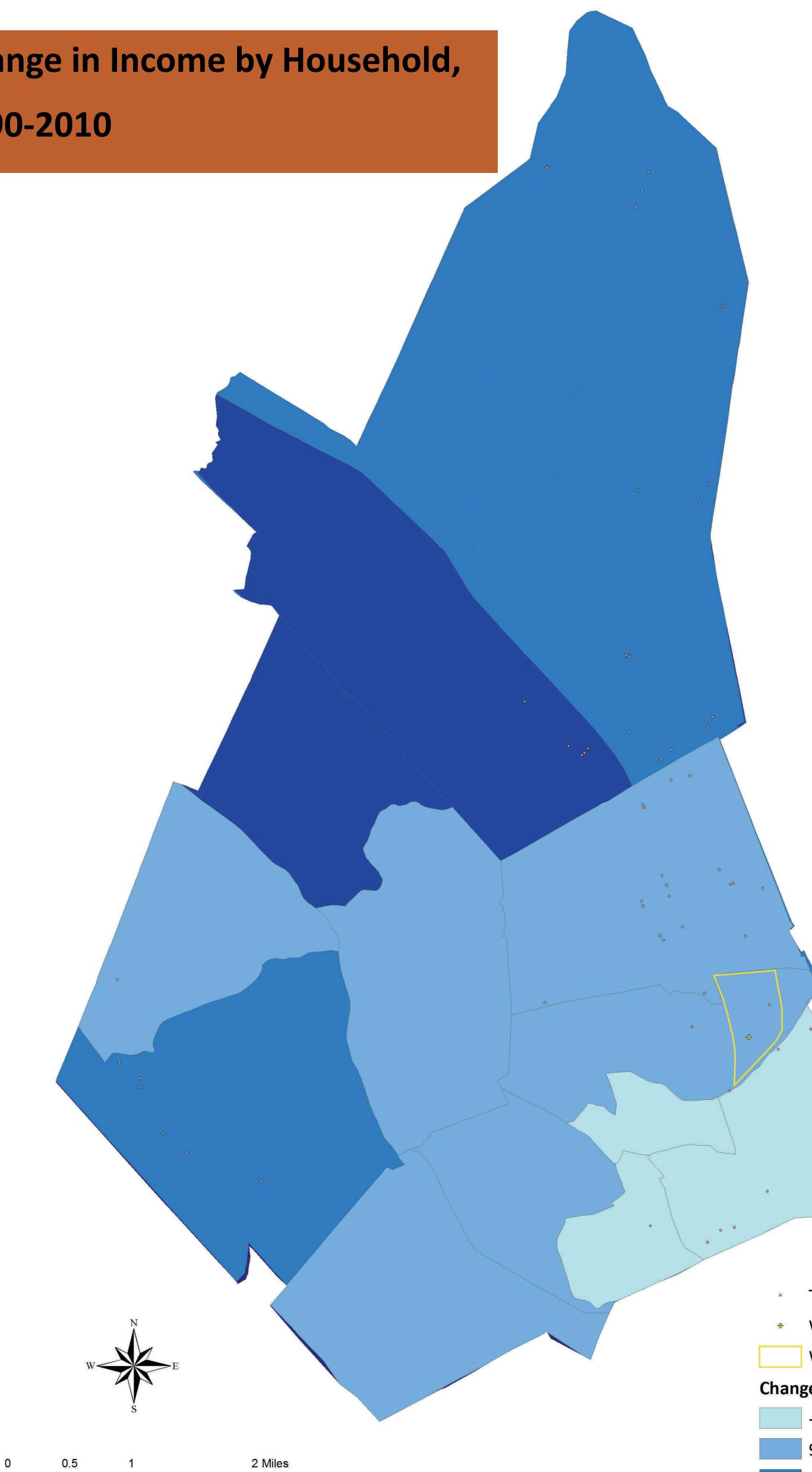
Project Findings

Below: Though there has been a significant change in income, the change has not elucidated the status of environmental justice in the area.

Right: There has been a significant change in the minority population of the area between the years 1990 and 2010.

Percent Change in Minority Population, 1990-2010

Change in Income by Household, 1990-2010



• TRI
• Wells G&H
W. R. Grace, NEP, Beatrice Foods

Change in Income by Household

-4735.750000 - 9546.285714

9546.285715 - 35575.333333

35575.333334 - 54555.727273



• TRI
• Wells G&H
W. R. Grace, NEP, Beatrice Foods

Change in Minority

-0.516346% - 2.692219%

2.69222% - 5.979183%

5.979184% - 10.854096%

Conclusion

The examination of the community in terms of minority population are statistically significant and show an influx of minority communities in the years between 1990 and 2010. However, data on changes in income are inconclusive and contradictory. Income in the area has risen, whereas the hypothesis that the area is lacking in environmental justice would encourage expectations that income would have dropped. On the other hand, in the areas where income has risen more significantly, there is a greater abundance of single family homes; areas closer to the superfund sites have a greater number of multi-family homes, which may indicate a lower land price near Superfund sites.

Though the results of this study are inconclusive, it is worth noting that the groundwater in the area is still contaminated, and the EPA has yet to complete the cleanup process (epa.gov). Though the regulations that are in place are a good start to protecting communities, there are still dangers in the area, and more regulations should be put in place to protect the community.

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Professor: Carl Zimmerman, TA: Carolyn Talmadge

Data Sources: toxmap.nlm.nih.gov, American Census Bureau, MassGIS

Scale: 1:18,000

Projection:

NAD_1983_StatePlane_Massachusetts_Mainland_FIPS_2001_Feet

References:

Durant, John; Chen, Jia; Hemond, Harold; Thilly, William. *Elevated Incidence of Childhood Leukemia in Woburn, Massachusetts: NIEHS Superfund Basic Research Program Searches for Causes*. Environmental Health Perspectives, Vol. 103, 1995.

Wells G&H, epa.gov, http://yosemite.epa.gov/r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/25001afe0850c69a8525691f0063f701!OpenDocument