Updating the Massachusetts Environmental Justice Map

A Project with Alternatives for Community and Environment (ACE)

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Introduction

In 2002, the State of Massachusetts adopted an environmental justice (EJ) policy, in which EJ communities were defined as "those most at risk of being unaware of or unable to participate in environmental decision-making or those most unable to gain access to state environmental resources."

The state identified four criteria for designating EJ communities: median household income; percent minority population; percent foreign born population, and linguistically isolated households. A map was created of qualifying communities and a commitment was made to update it every ten years.

My partner Ian Jakus and I worked with the environmental justice organization Alternatives for Community and Environment (ACE) in Roxbury, Massachusetts to explore possible changes to the 2002 map for its 10 year anniversary. Their staff lawyer Staci Rubin asked us to investigate how census data collection has changed since 2002 and suggest alternative criteria and thresholds as we saw fit.

Process

Our first step was to understand how census data collection techniques have changed since 2002. Three of the four EJ criteria used then were gathered from the 2000 census’ “long form,” which asked households more detailed questions and was discontinued in 2010. It was replaced by the American Community Survey, which samples fewer households on an ongoing basis instead of every ten years and often has a higher margin of error. After exploring possible categories to use in an updated map, we chose the following:

<table>
<thead>
<tr>
<th>Home of Category</th>
<th>Definition</th>
<th>Quantile Threshold</th>
<th>Number of Qualifying Tracts</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority</td>
<td>% population that identifies their race as other than &quot;white alone&quot;</td>
<td>26.0% or more</td>
<td>363</td>
<td>25.0%</td>
</tr>
<tr>
<td>Income</td>
<td>Median income in the last 12 months (2010 inflation-adjusted dollars)</td>
<td>$44,550 or less</td>
<td>369</td>
<td>25.0%</td>
</tr>
<tr>
<td>Single Mothers</td>
<td>Family with/without a householder 18 years old or older, with female householder and no husband present</td>
<td>0.9% or more</td>
<td>371</td>
<td>25.2%</td>
</tr>
<tr>
<td>Educational</td>
<td>Population 15 years and older with high school diploma</td>
<td>83.1% or less</td>
<td>371</td>
<td>25.2%</td>
</tr>
<tr>
<td>Renters</td>
<td>Households in which all age 7 or older speaks English only or speaks English very well</td>
<td>56.3% or more</td>
<td>369</td>
<td>25.0%</td>
</tr>
<tr>
<td>Language isolation</td>
<td>Households in which no age 5 or older speaks English only or speaks English very well</td>
<td>6.0% or more</td>
<td>363</td>
<td>24.8%</td>
</tr>
</tbody>
</table>

A tract needed to meet minority, income, or 2 of the 4 other criteria to qualify.

Our next step was to decide how to classify the criteria and designate EJ thresholds. We decided quantities were the best classification method. Because each quantity has an equal number of data points, it is arguably more objective, and the maps we made with quantities showed clustering we did not see when we used the State’s seemingly arbitrary cutoff values from 2002.

Next, we selected which census tracts qualified as “EJ” for each criteria and coded them numerically in our attribute table. By summing and querying these new fields, we were able to make a list of which criteria each census tract met, and how many total criteria each EJ tract met.

Results and Conclusions

Overall, we found that 539 of Massachusetts’ 1474 census tracts met one or more of the EJ criteria. This represents 36.6% of the states’ census tracts and 32.7% of the state’s population. Intriguingly, these tracts met almost all criteria (215) than met only 2 or 1 criteria (162). This indicates there is strong clustering of EJ factors in communities, which is apparent in our map.

In conclusion, we learned that the US Census Bureau is crucial in providing data for policy. The changes that were made in its data collection methods in the past decade make it difficult for state governments to maintain their previous policies without risking data error. Data are incomplete and subject to interpretation, especially when decisions are made about thresholds. A number that might logically “sound good” can sometimes ignore important trends.

In the future, we hope a GIS student or ACE member will map polluting facilities or greenhouse gas emissions over EJ tracts to examine their correlation.

Project Team:
NAD_1983_StatePlane_Massachusetts_Fips_2001
Data Sources:
US Census Short Form 2010 and American Community Survey 5 Year Estimates, 2006-2010