

Demographics in the Johnson Creek Watershed in Portland, Oregon

Final Project for GIS 267, Spring 2013

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The Johnson Creek Watershed Council (JCWC) has been promoting restoration of the Johnson Creek watershed for almost 30 years, with the first iteration of the council, Friends of Johnson Creek, debuting in 1984. The Council's mission is to "promote restoration and stewardship of a healthy Johnson Creek Watershed through sound science and community engagement."

Restoration requires the expected kinds of science-driven fieldwork such as removing invasive plants, planting natives, measuring water quality parameters, etc. But the community engagement aspect of the work can be challenging since it involves the humans in the watershed. Johnson Creek is highly urbanized and is susceptible to the ills of urban life such as pollution, high water temperatures, erosion and sedimentation to list a few threats. Most of these are directly related to human activities throughout the area, and the Council works with communities to educate residents about how their activities affect the Creek's health, and what they can do to decrease these negative effects.

The Council knows that the watershed is home to a diverse population of people, with different languages, traditions, values, and points of view. These differences enhance the communities, but they also increase the challenges of outreach. In order to be more effective the Council needs to know more about the demographic makeup of the region. The scope of this project is to map three parameters in the watershed; population, income, and primary non-English language spoken in the area.

Methods

The data required for these maps was available to the public and sources and methods for each topic will be described below. The shape files for census tracts and block groups were obtained from the U.S. Census Bureau. The watershed boundary was obtained from delineating the watershed in the U.S.G.S. StreamStats website, and exporting it as a shape file to use in ArcGIS.

Population

The population data was mapped as density, people per square mile. This data was downloaded from the RLIS files for census data. Of course the census tract boundaries do not match the boundaries of the watershed, so the tracts needed to be clipped to the watershed shape file. But the tracts on the edge of the watershed would be smaller, and new areas were calculated for the partial tracts. Therefore, it was necessary to calculate the population density *before* clipping the file, because the calculated values were not changed by clipping.

The maps showing the percentages of three non-white races, African American, Hispanic, and Asian, also used the RLIS census data. These maps were also clipped to the watershed boundaries but percentages are not affected by the tract area being recalculated so special handling was required.

Language

The data for “language spoken at home” was obtained from the U.S. Census Bureau, which provides three designations for each language: number of total language speakers, number of these who speak English “very well,” and number who speak English less than “very well.”

Because the Watershed Council’s objective was to determine which residents would benefit from non-English outreach efforts, we focused on residents who spoke the four most common

non-English languages in the watershed (Spanish, Russian, Vietnamese, and Chinese), and who spoke English less than “very well.” This was interpreted to mean that the non-English language was their primary language. This data is by entire census tracts, whereas the census tract shape file is broken into block groups within census tracts. Therefore, the divisions were dissolved to census tract level before joining the data to the file. The percentage of the population who spoke each language and the number of primary speakers was calculated based on census tracts. The whole census tracts are displayed because although the percentage was valid in clipped tracts, the raw number would not be valid for the clipped portions and could give a skewed perspective on the data.

Free Lunch

The data for eligibility for the Federal Free Lunch program was obtained from the Oregon Department of Education. Eligibility for the Federal Free Lunch program is based on family size and other factors. For example, a child who lives in a household of four with a combined income of less than \$30,000 a year is eligible for free lunches. There are more schools, mostly private, within the watershed but this map shows only those for which data was provided. The school locations were obtained from RLIS an RLIS shape file, and then the free lunch data was joined to it.

Median Income

Median income data was downloaded from the U.S. Census Bureau and joined to the whole tracts file. Here again the whole tracts were displayed with the watershed boundary superimposed over it.

Results

One map shows population density and there is one map each for percentage of African Americans, Asians, or Hispanic residents within the population. The two income-related maps show median income and eligibility for free lunches. Four maps show where the most commonly spoken non-English languages are.

These maps are inserted after the Data Sources section.

Conclusions

The results show that in the Johnson Creek watershed, in the schools which provided data, 69% of children qualify for the Federal Free Lunch program. A diversity of races lives in the watershed, including people who self-identify as Hispanic (13%), Asian (8%), African American (4%), and Native American (1%). The four most commonly spoken languages, other than English, are Spanish, Russian, Vietnamese, and Chinese. The areas of higher concentration of specific languages and ethnicities match what was expected from familiarity with the communities in the area, but it is always useful to have data to back up perceptions. Of course the next step would be a thorough analysis of what these results mean for the Council's outreach and connections with the Johnson Creek community.

These methods had some drawbacks, such as not being able to define precise numbers of people in specific areas due to the fact that watershed boundaries do not match census tract boundaries. It would be very useful to find a method to provide more exact values for these areas. Other demographics might prove to be useful as well, such as age and home ownership status, which might be worthwhile to pursue in the future.

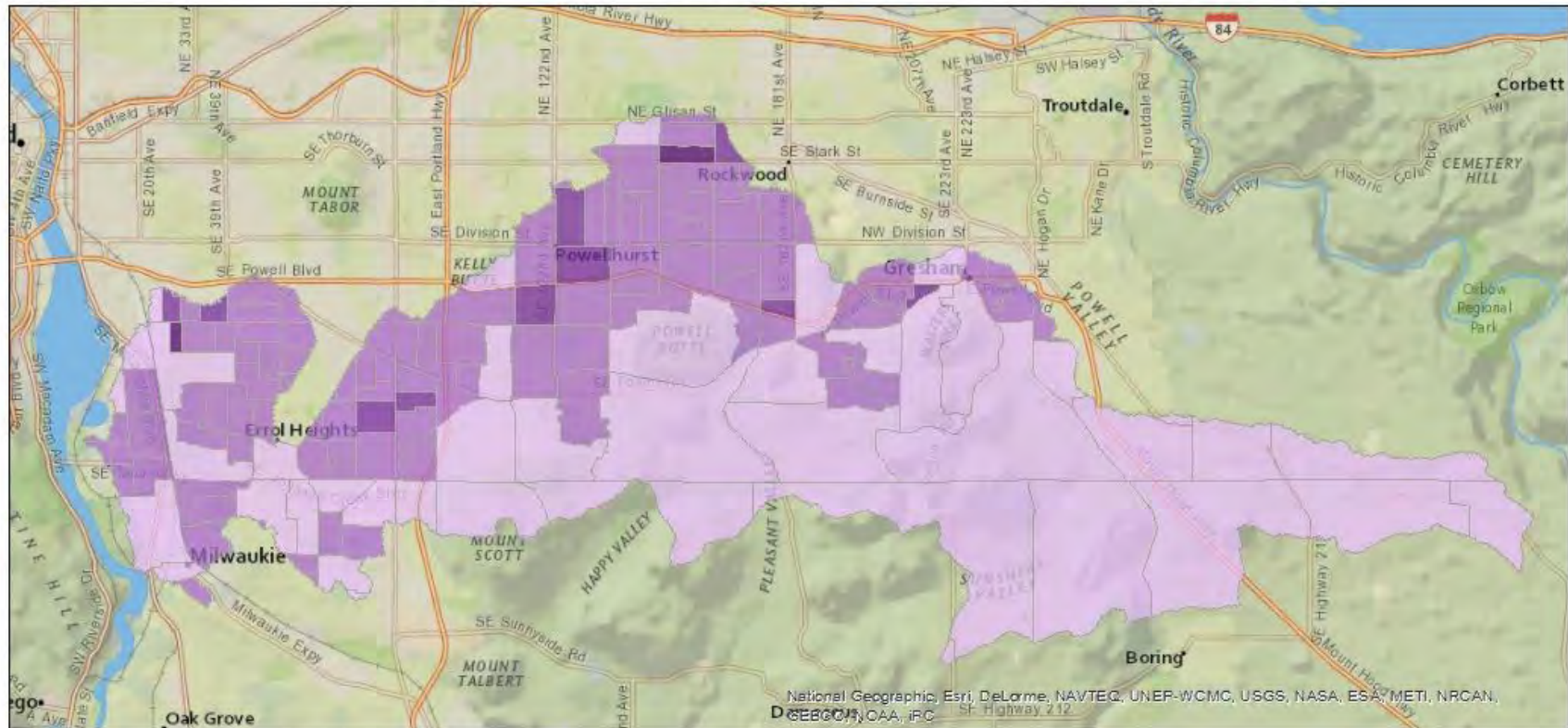
Data Sources:

Data Name	Description	Source	Metadata
Watershed boundary	Watershed delineation of Johnson Creek.	USGS, Stream Stats	http://streamstatsags.cr.usgs.gov/or_ss/default.aspx?stabbr=or&dt=1370452746555
Census tracts	Census tract outlines	RLIS	http://rlisdiscovery.oregonmetro.gov/
Schools	Point file of public schools	RLIS	http://rlisdiscovery.oregonmetro.gov/
Free Lunch	Number of students eligible for federal free lunch program	Oregon Dept of Education	www.portlandonline.com/portlandplan/index.cfm?c=52257&a=288623
Language	Language spoken at home.”	US Census Bureau	http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

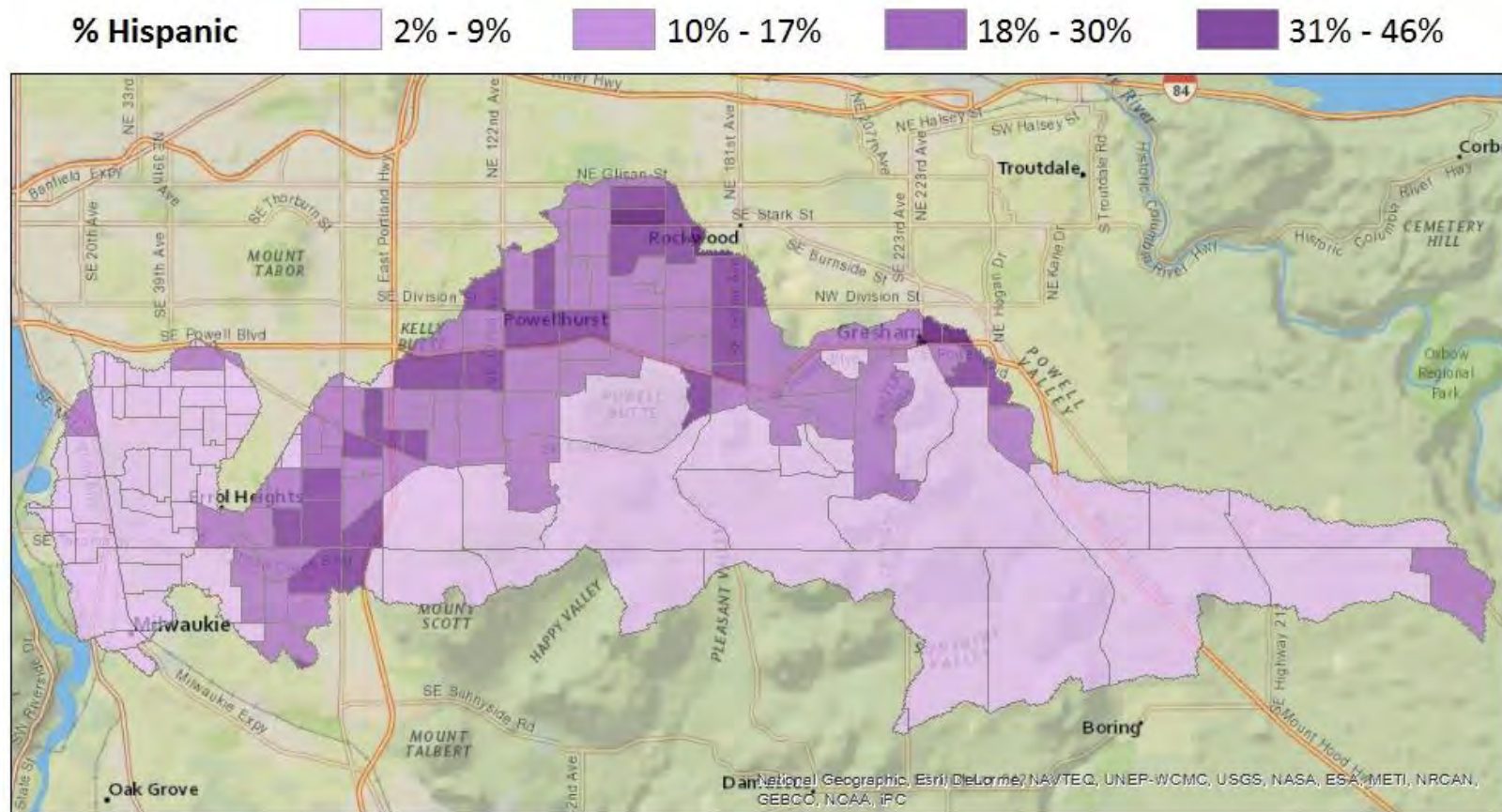
Johnson Creek Watershed Population Density

Number of people per square mile, by census tract

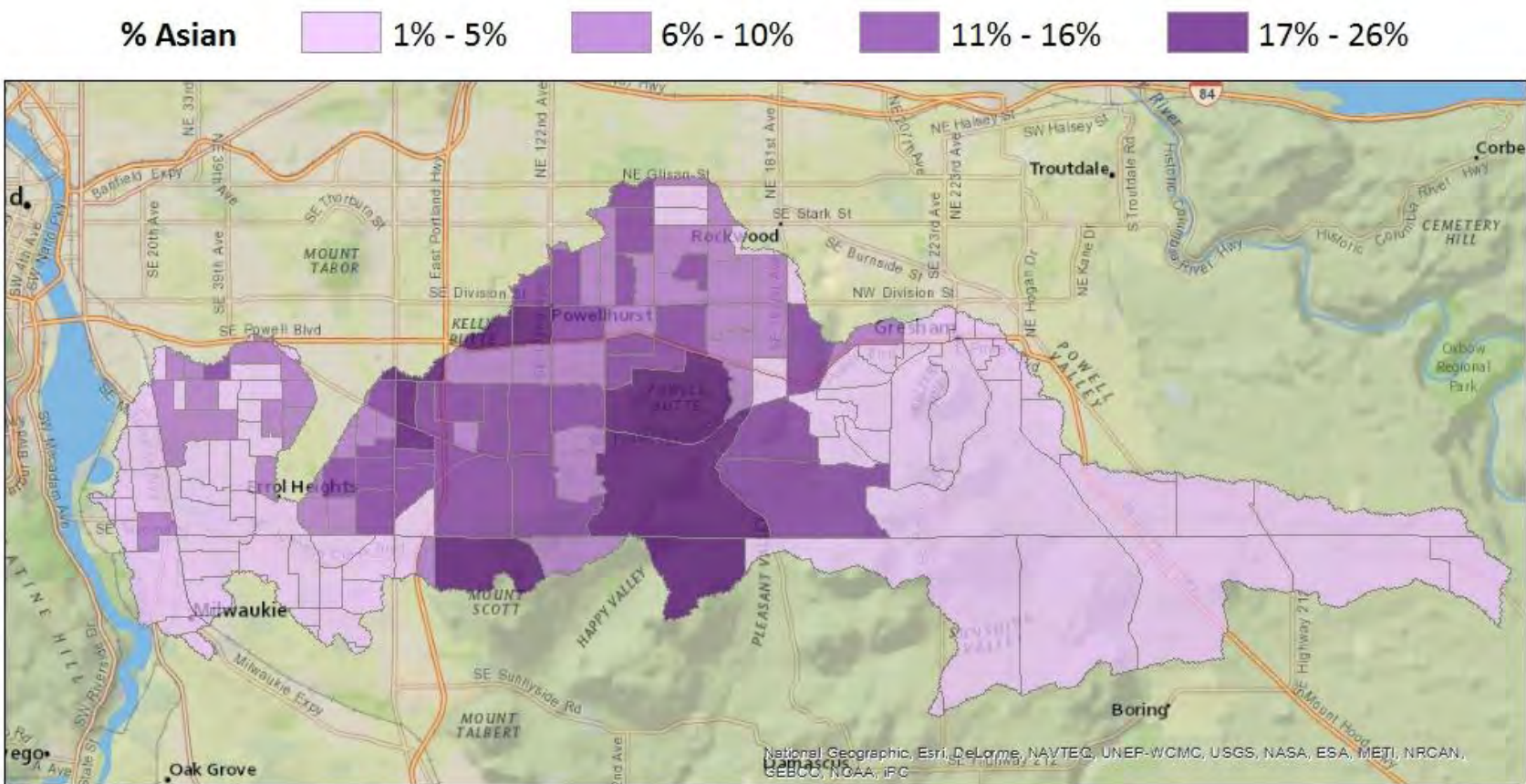
185 - 5000 5001 - 10000 10001 - 15000 15001 - 20000



Percent of Hispanic Residents in Johnson Creek Watershed by Census Tract

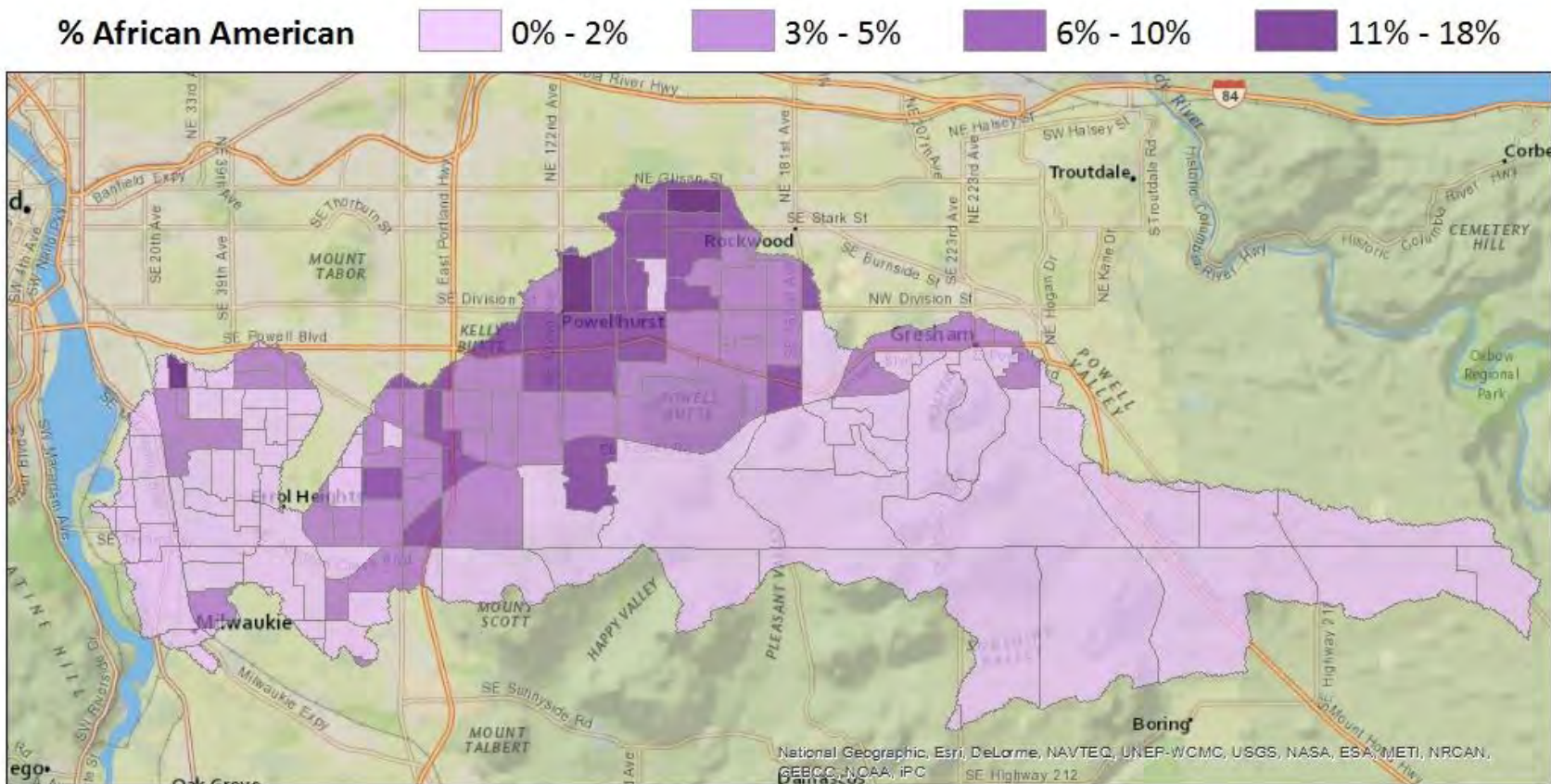


Percent of Asian Residents in Johnson Creek Watershed







Percent of African American Residents in Johnson Creek Watershed

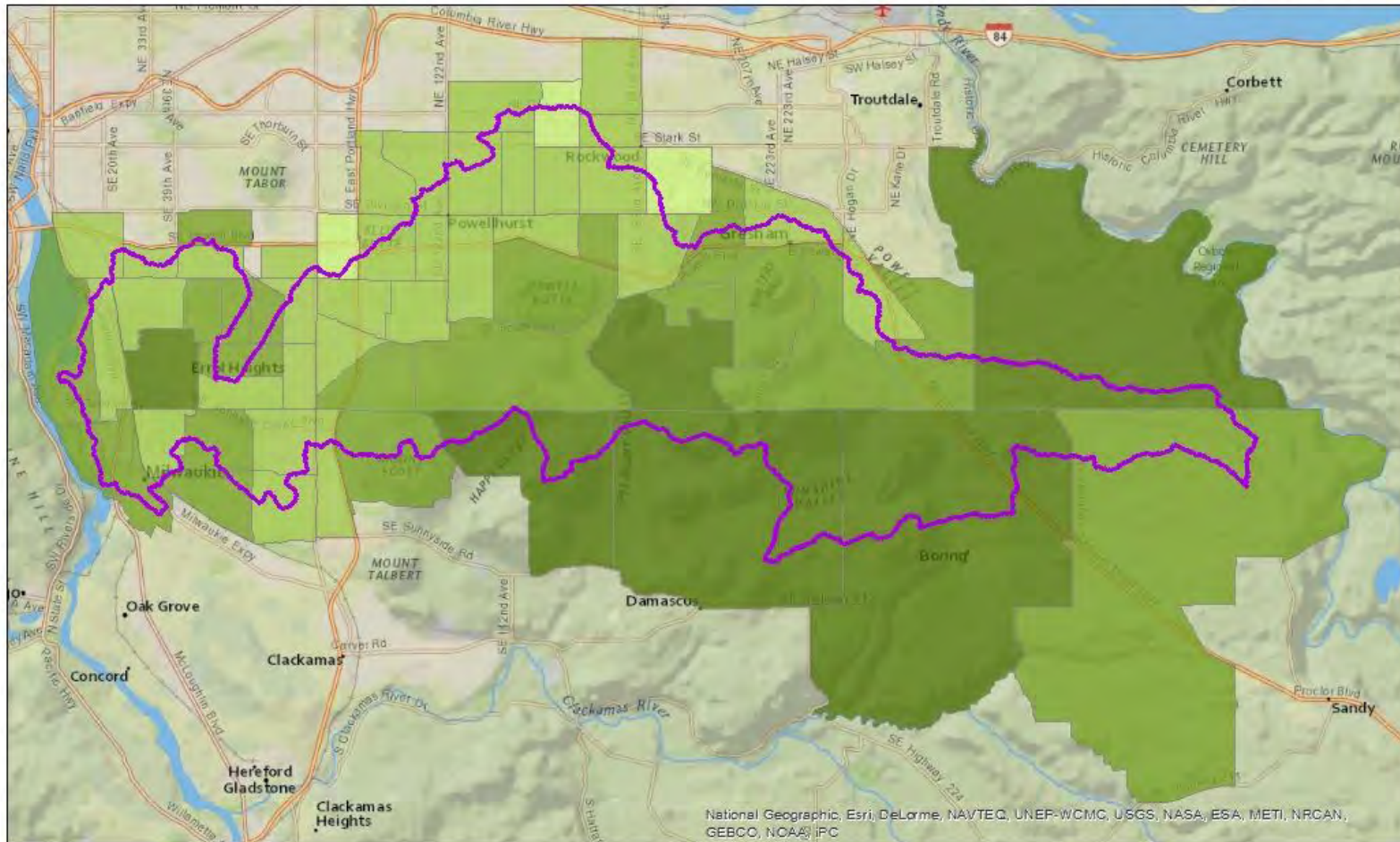
by Census Tract



Median Income in the Johnson Creek Watershed

 Johnson Creek Watershed Boundary

Median  \$23,799 - \$30,000  \$30,001 - \$50,000  \$50,001 - \$75,000  \$75,001 - \$99,000



Student Eligibility for Free Lunch Program* within Johnson Creek Watershed

*Eligibility for free lunch based on household income (of 4) less than \$30,000 per year.

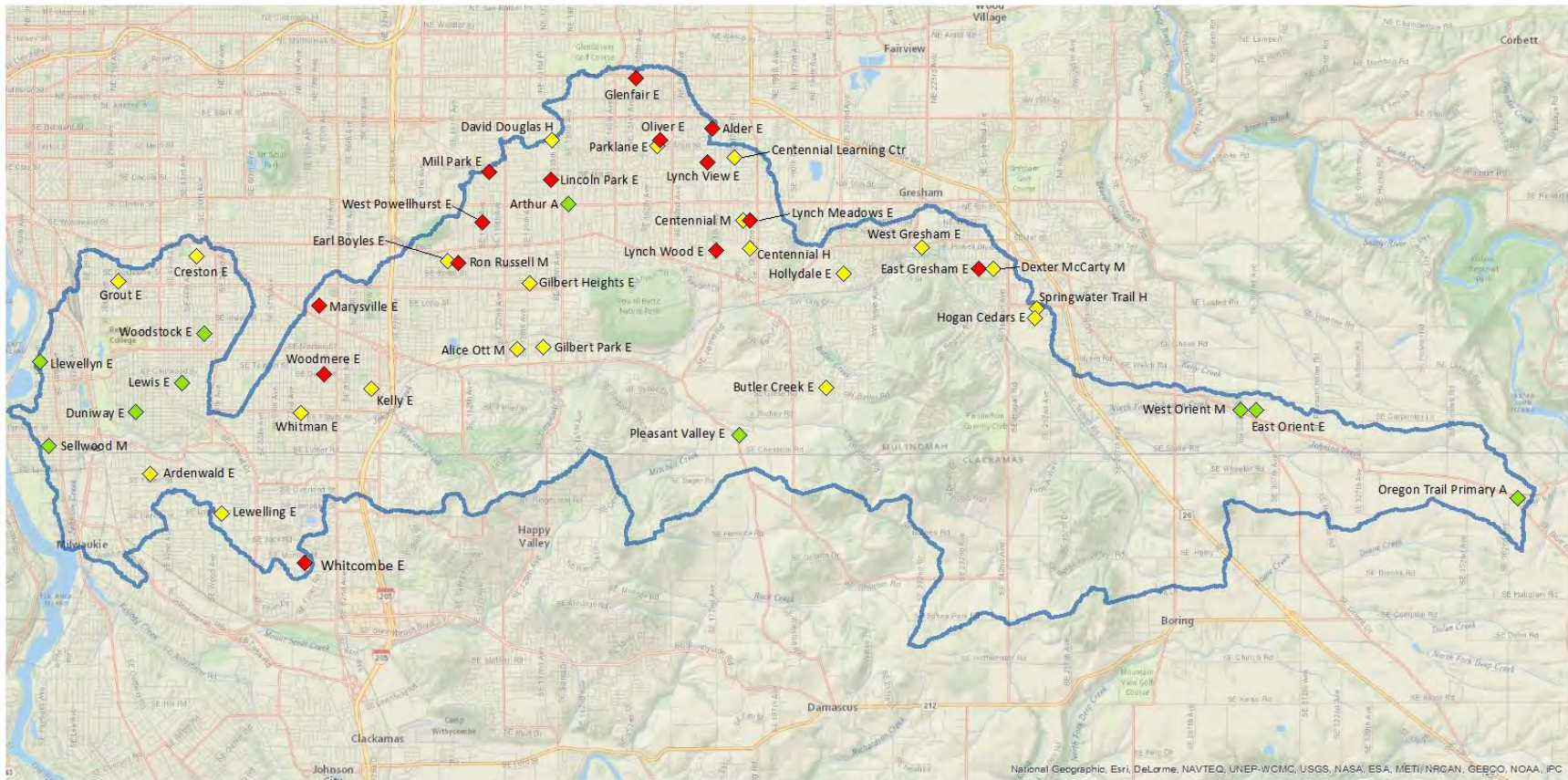
E = Elementary M = Middle H = High A = Academy

◆ Less than 50%

◆ 50% to 75%

◆ More than 75%

▭ Johnson Creek Watershed



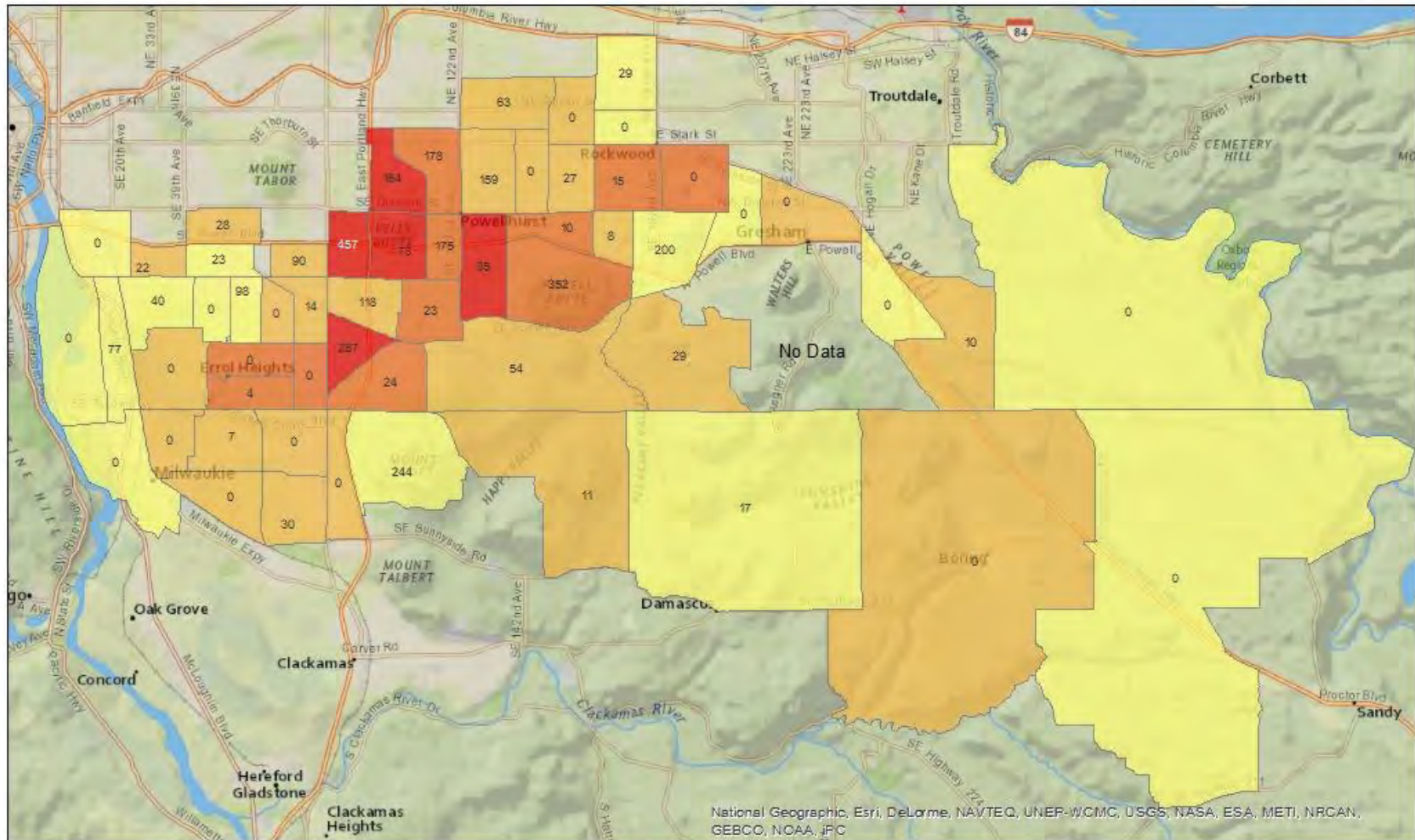
Areas shown are census tracts, labeled with how many people primarily speak Russian.

☐ 0%

1% - 3%

4% - 6%

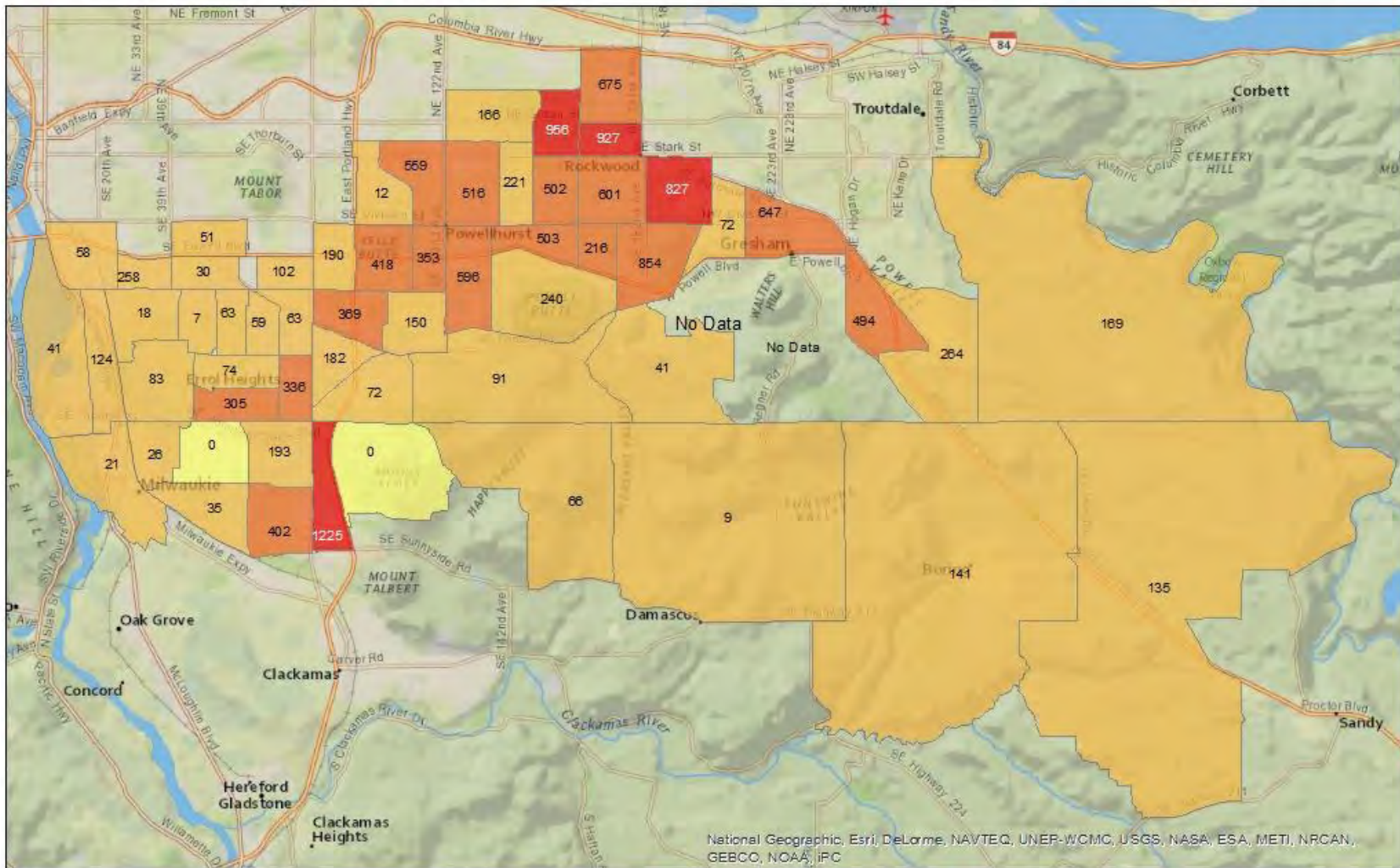
■ 7% - 10%



Spanish Speakers in the Johnson Creek Watershed

Areas shown are census tracts, labeled with how many people primarily speak Spanish.

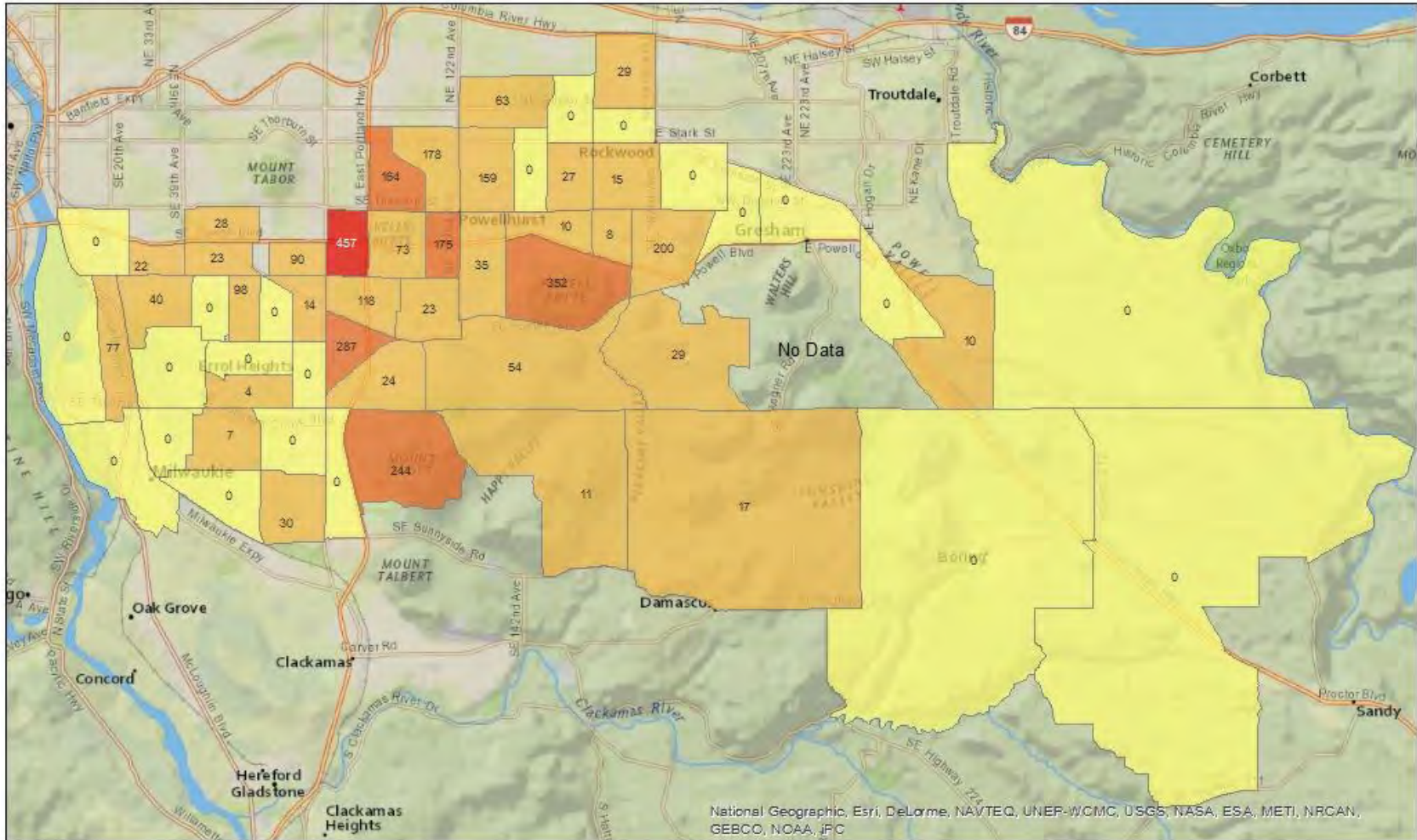
% Spanish as Primary Language 0% 1% - 7% 8% - 16% 17% - 27%



Chinese Speakers in the Johnson Creek Watershed

Areas shown are census tracts, labeled with how many people primarily speak Chinese.

% Chinese as Primary Language 0% 1% - 4% 5% - 8% 9% - 14%



Vietnamese Speakers in the Johnson Creek Watershed

Areas shown are census tracts, labeled with how many people primarily speak Vietnamese.

% Vietnamese as Primary Language 0% 1% - 2% 3% - 5% 6% - 7%

