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April 21, 2020

### **King County Educational Opportunity Index**

In this report King County will undergo an Educational Opportunity Index. Areas that have a lower educational opportunity will be identified along with areas that have a higher opportunity of success. King County should have an equitable educational system but does it really? Opportunity mapping can show this by looking at different indicators of education. Then we can analyze the different maps and propose areas that are in need of resources in King County, WA.

This educational opportunity index shows where there is educational inequality in King County. Places that have lower opportunity can be looked at to bring educational equity to the county. The five indicators are reading proficiency, math proficiency, student poverty rates, teacher qualifications, and graduation rates. Each indicator was collected at the census tract level and for each census tract the rate/score of the three schools closest to its centroid are averaged. The census tracts are then given five indicator Z-scores to standardize the data to be combined for the composite index. For the composite Reading proficiency and math proficiency are based on the schools 2010-2011 4<sup>th</sup> grade class WASL test scores. These scores relate to how well students are at understanding information and at problem solving. Student poverty rates are based on the percentage of students that have free or reduced-price lunches. These poverty rates are negatively correlated with opportunity, meaning that as student poverty rates go up the opportunity for success tends to go down. Because of this, this indicator is multiplied by -1 so that it can be combined with the other Z-scores. Teacher qualifications is the rate of teachers at the schools that have a master's degree or more. This is positively correlated; a school having more teachers with master's degrees or more reflects there being a higher opportunity for success. Graduation rate is the percentage of students that graduate. When a school's graduation rates are higher it means there is a good opportunity for educational success in the area.

Reading proficiency across King County is specifically low from Seattle down to Federal Way (Figure 1). This is surrounded by other moderate to low locations as well. There are two other very low locations in Bellevue and between Kirkland and Shoreline. These locations seem to be surrounded with less low/moderate and more high/very high locations. Math proficiency has a high concentration of very low opportunity areas from Seattle to Federal Way (Figure 2). Little very low opportunities elsewhere and high/very high opportunity areas seem to be mostly in the northwest section of the county. Across King County student poverty rates are very low/low from Seattle to Federal Way surrounded mainly by other moderate locations (Figure 3). Very high/high locations make up most of the north section of King County. Teacher qualifications have very low opportunity areas in Auburn, Bellevue, Burien, and the northeast of the county (Figure 4). Very high opportunity areas are Renton, Vashon Island, and the southeast of the county. Very high opportunity areas are close to some very low opportunity areas, but around very high areas are still high areas and around very low areas are low areas. Graduation rates across the county show three clustered very low opportunity areas (Burien, Federal Way, and Seattle) surrounded by low areas (Figure 5). From the very low/low areas is a mix of the moderate/high opportunity areas leading to the very high areas of Issaquah, Shoreline, and the northeast section of the county. There is a strange very high location between Burien and Des Moines in the middle of the very low opportunity area. Between the maps, it seems that from Seattle to Federal Way provides lower opportunity for educational success while higher opportunity is located in the middle to north section of the county, specifically from Kirkland to Maple Valley and then to North Bend. Teacher qualifications seemed to be the most sporadic of the indicators as its very high opportunity areas were in the south and the very low areas were more spread out.

The composite index map reinforces that from Seattle to Auburn there is very low opportunity for educational success (Figure 6). There is another very low/low cluster in Bellevue (Figure 6). Very low opportunity areas are mainly surrounded by low opportunity areas. These very low opportunity clusters seem to be in urban cities or where there is fewer green spaces and more people. Very high opportunity

for educational success is from Maple Valley up through to Redmond and Bothell (Figure 6). There are other small clusters around Kirkland and north of Seattle (Figure 6). These very high opportunity areas are surrounded mainly by high/moderate opportunity area. Census tracts 114.02, 284.03, 288.02, 115, and 264 are the five lowest in the county for educational opportunity and they are all located between Seattle and Kent (Figure 6). Census tracts 322.11, 323.27, 322.03, 322.07, and 322.10 are the five highest in the county for educational opportunity and they are located between Redmond and Issaquah (Figure 6).

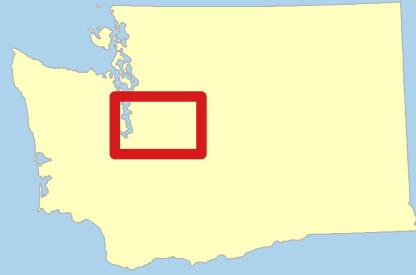
Instead of all the indicators being weighted the same in the educational opportunity index the five indicators are weighted differently. For reading proficiency and math proficiency, I kept each at 20% so they account for  $1/5^{\text{th}}$  of the index. I left them at this because I think it is important to look at how the children are performing in reading and math and they are based on standardized tests. Student poverty rates I raised to 30% because I think if you can't get access to resources you won't be able to do as well in school. Additionally, I think that students in poverty may have a lower self-esteem and may not be confident in their educational abilities. For teacher qualifications and graduation rates I lowered their weight to 15% of the opportunity index because they seem slightly redundant. This is because I think it is less about what degree the teacher has and more about how much the students are getting from their teacher. For graduation rates I think it shows that students who are doing well are passing and graduating. Reading proficiency (Figure 1) and math proficiency (Figure 2) are both very similar to the overall index (Figure 6) which justifies why I kept them as being a normal weight. Student poverty rates are more clustered together and clearly show where there is very high versus very low opportunity and justifies my choice to make the weight higher (Figure 3). Teacher qualifications (Figure 4) and graduation rates (Figure 5) are more spread out across King County than in the composite index (Figure 6) which in turn justifies why I chose to lower both of these indicators weights.

From analyzing the five indicators and the composite educational opportunity index one can see that there is a less than average opportunity for someone to succeed in areas ranging from Seattle to Auburn and around Bellevue (Figure 6). These lower opportunity areas need more resources to be more

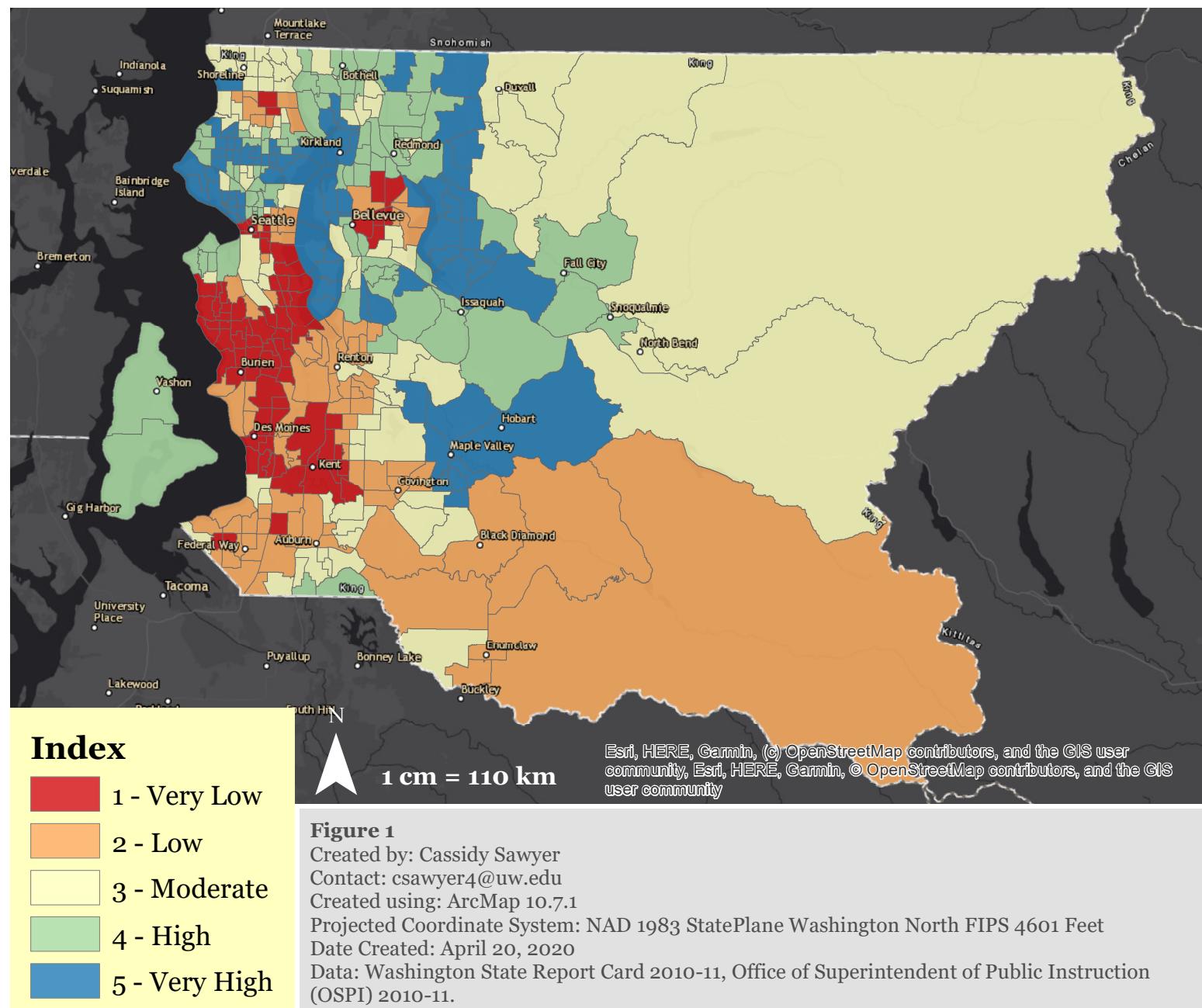
leveled with their higher opportunity area counterparts. Areas with a lower opportunity seems to be located along the coast while higher opportunity areas are more inland. A closer look into these lower opportunity areas could shed light onto why there is less opportunity to succeed. I think that the student poverty rate map (Figure 3) looks very similar to the composite map (Figure 6). Areas with more poverty have a lower opportunity for success because with less money in the household there is less money to spend on school resources and there may be less self-confidence in the student's abilities which results in a lower opportunity to succeed.

# Educational Opportunity Index

## Reading Proficiency in King County, WA

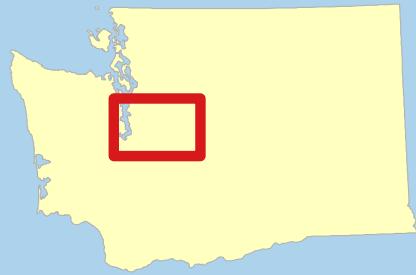


This educational opportunity index of King County is only referencing the reading test scores from the WASL, a 4th grade exam in Washington. For each census tract, three schools that were closest to the tract's centroid averaged their reading test scores. To standardize reading proficiency the scores were converted to Z-scores. This helps determine what the average/moderate reading scores are to show where high and low opportunity resides in King County. Reading is an important educational indicator as it helps take a look at children's understanding of the English language. In places where reading proficiency is low this could mean there is a language barrier. If kids can understand what they are reading then they have a good opportunity for success.

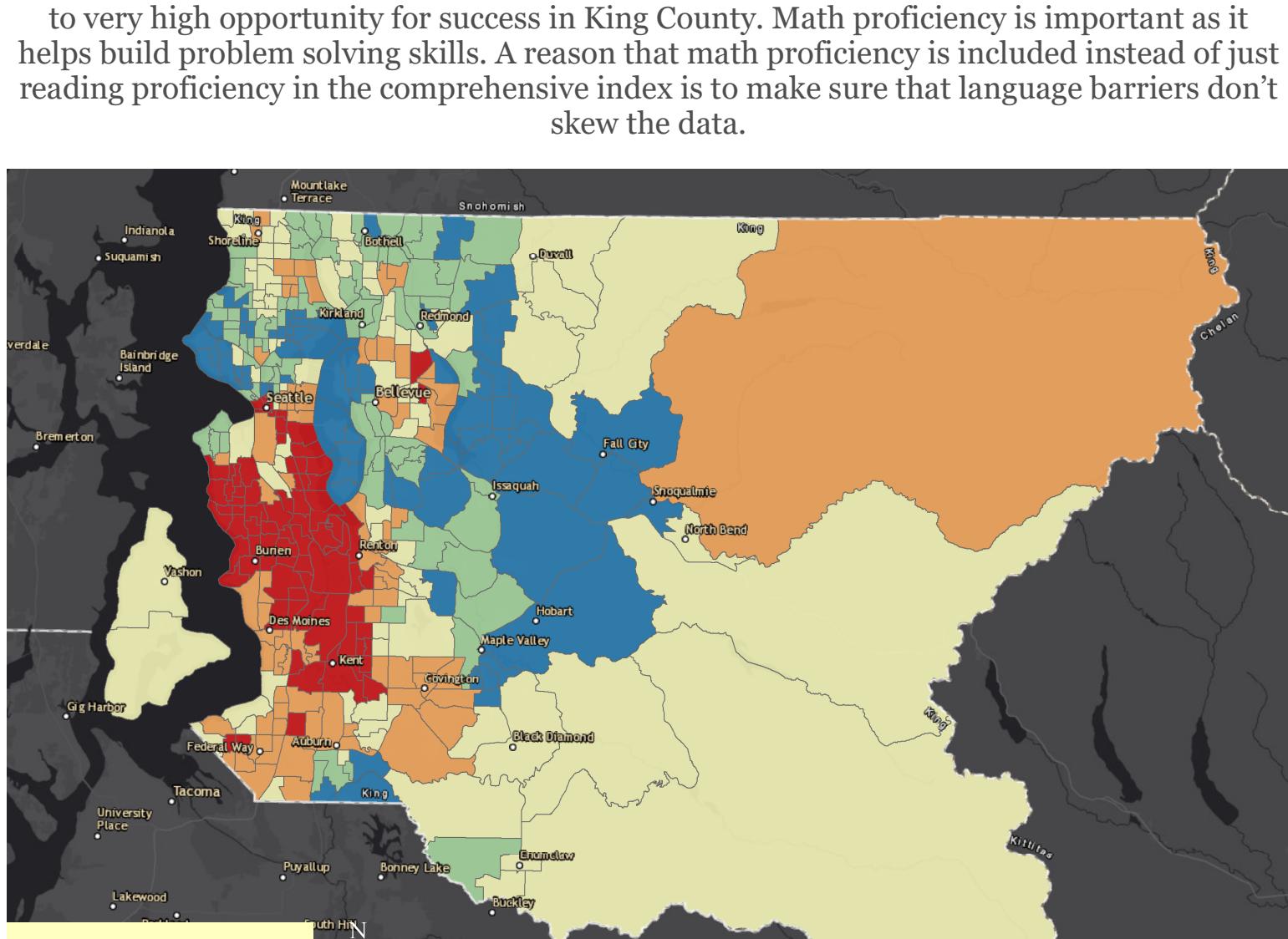


# Educational Opportunity Index

## Math Proficiency in King County, WA



This educational opportunity index of King County is referring to the math test scores from the WASL, a 4th grade exam in Washington. The math test scores from three schools that were closest to the census tract's centroid were averaged to get one score per tract. Z-scores were created to standardize math proficiency and create five classes ranging from very low to very high opportunity for success in King County. Math proficiency is important as it helps build problem solving skills. A reason that math proficiency is included instead of just reading proficiency in the comprehensive index is to make sure that language barriers don't skew the data.



### Index

- 1 - Very Low
- 2 - Low
- 3 - Moderate
- 4 - High
- 5 - Very High

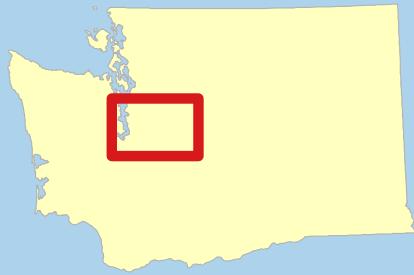
**Figure 2**

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Date Created: April 20, 2020  
Data: Washington State Report Card 2010-11, Office of Superintendent of Public Instruction (OSPI) 2010-11.

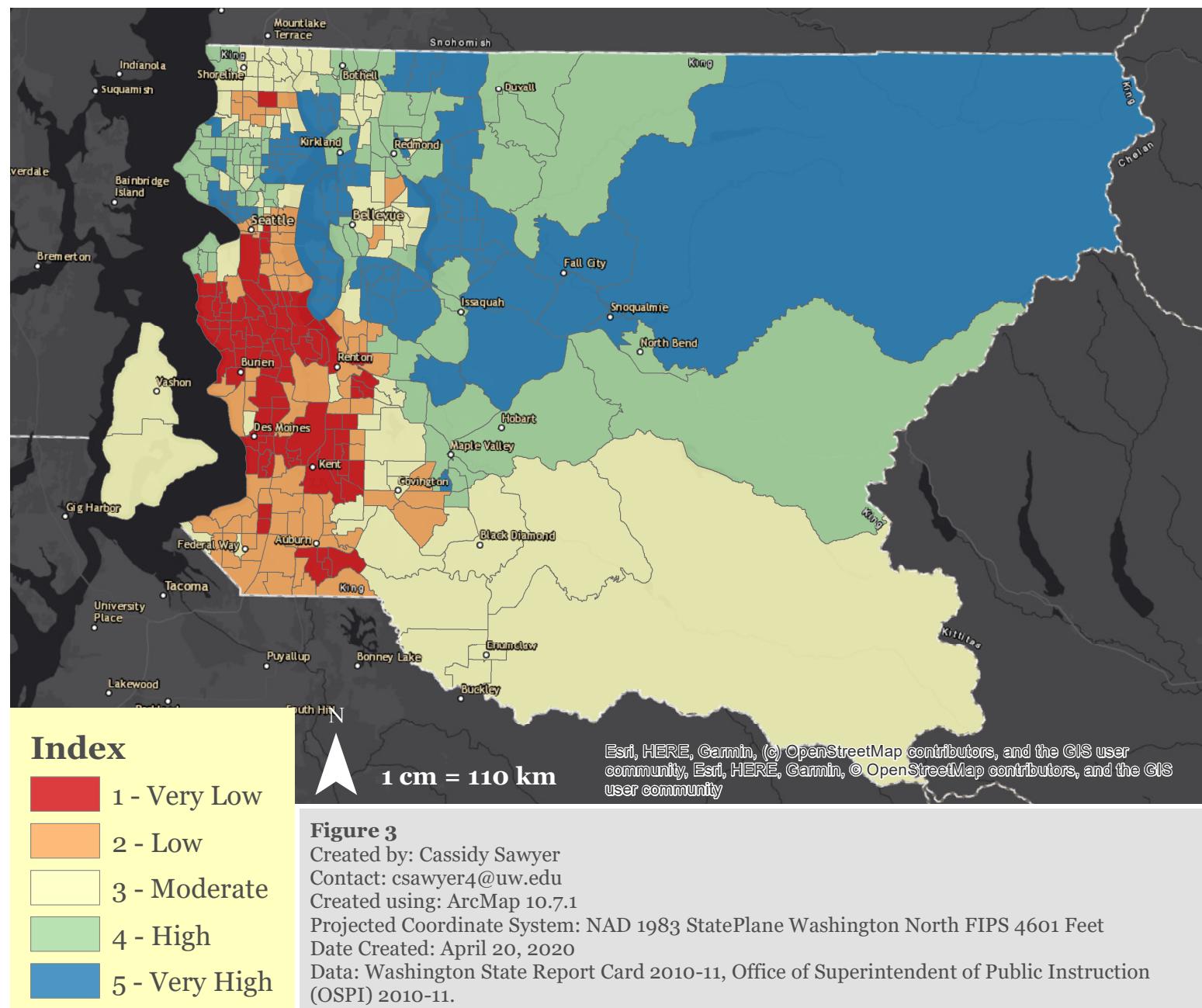
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# Educational Opportunity Index

## Student Poverty Rates in King County, WA

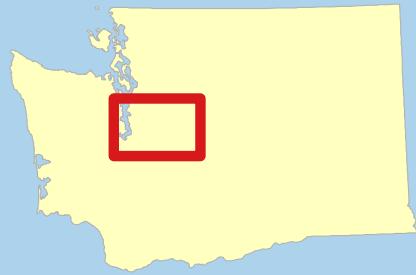


This educational opportunity index is a reflection of the student poverty rates in King County. Student poverty rates are based on the percentage of students that receive free or reduced-price lunches. This means the student's parents make under a certain amount of money that qualifies them for this help. Each school have a poverty rate and the average of three schools that are closest to the census tract's centroid were calculated. From here, a Z-score was found for each census tract. Since student poverty rate is negatively correlated with the opportunity for success, the Z-scores were multiplied by -1. Living in poverty usually means access to materials and resources are lower, and therefore a lower opportunity to succeed.

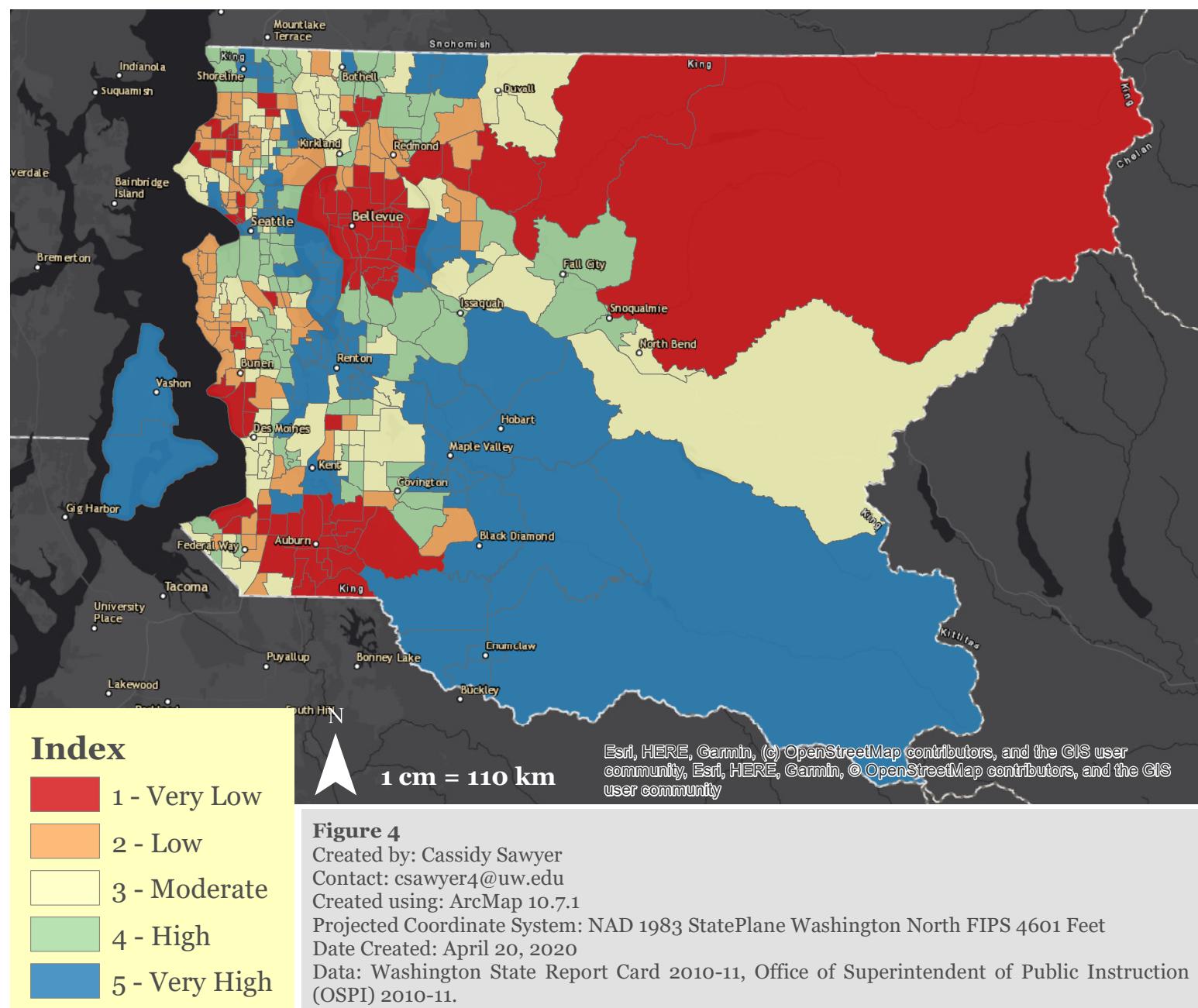


# Educational Opportunity Index

## Teacher Qualifications in King County, WA



One of the indicators for the comprehensive educational opportunity index in King County is the teacher's qualifications. This indicator looks at the rate of teachers with a master's degree or more in a school. To get this indicator to the spatial unit of census tracts the three closest schools to the tract's centroid were averaged. Next, the rates were converted to Z-scores to standardize the data. This map shows that where there is a higher rate of teachers with master's degrees or more there is also a higher opportunity for success. Teacher qualifications are positively correlated with opportunity. If a teacher is well educated, they are likely to educate their students.

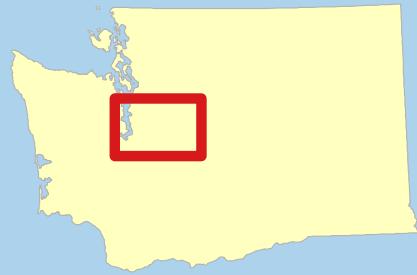


**Figure 4**

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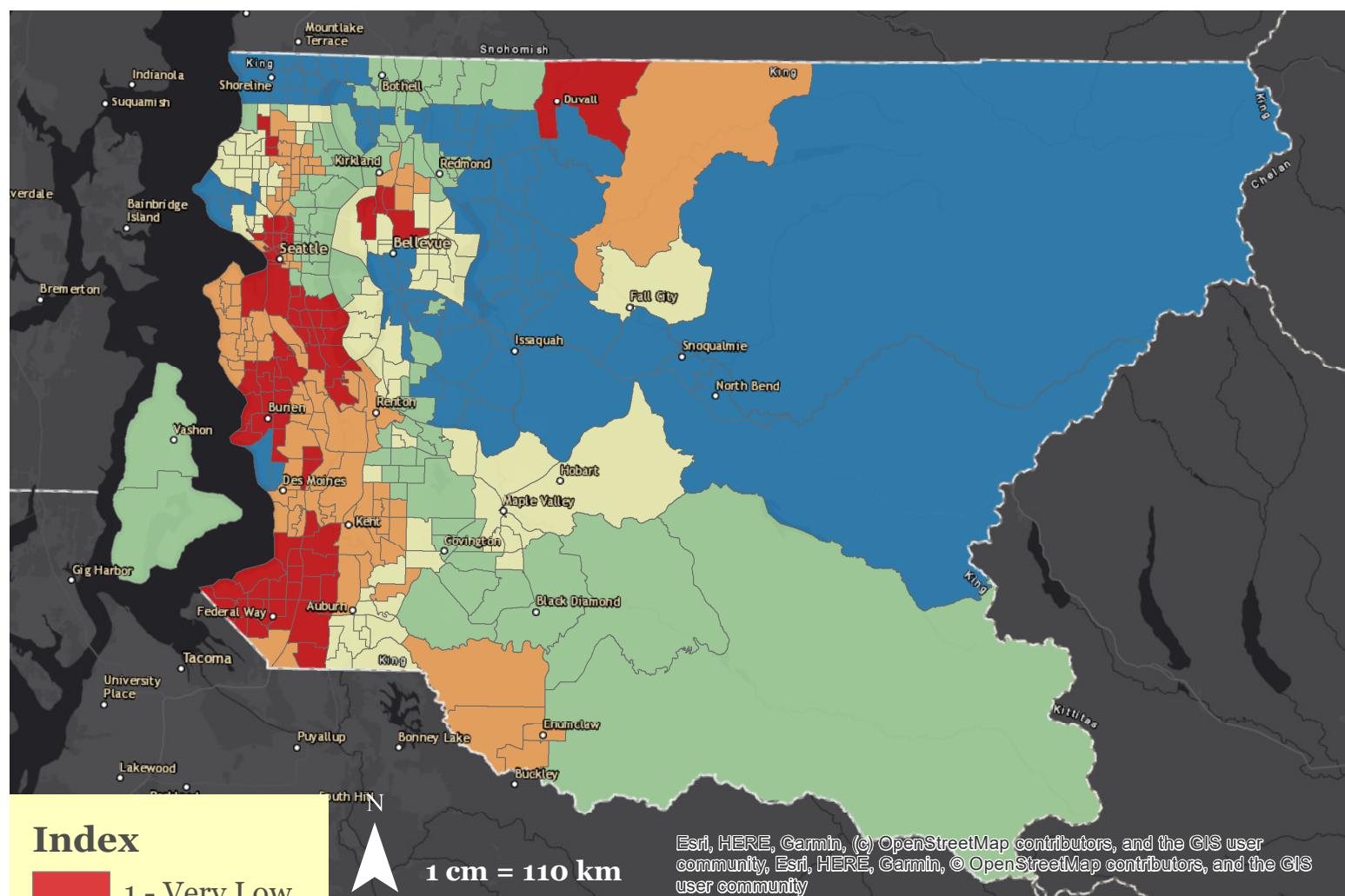
# Educational Opportunity Index

## Graduation Rates in King County, WA



One way to tell how good a school is, is by looking at their graduation rates. This indicator looks at how many students made it through school, which is positively correlated with success. Three schools that were closest to the census tract's centroid were averaged. This

averaged rate was then converted to a Z-score to standardize the data. Only taking graduation rates into account, this map looks at where more students graduated schools, and therefore where more opportunity to succeed is. School is a very important as it is the foundation to success in life. The No Child Left Behind Act of 2002 helped students have measurable goals and standards to live up to that help students' graduate school.



### Index

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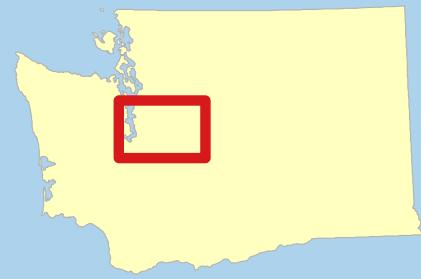
**Figure 5**

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# Educational Opportunity Index

## in King County, WA



An opportunity index looks at where there is more or less opportunity for success based on discussed indicators. This map displays an educational opportunity index of King County as these indicators are closely correlated with opportunity and success. The five indicators are reading proficiency, math proficiency, student poverty rates, and graduation rates. Student poverty rates are negatively correlated with opportunity and therefore means less opportunity for success. All of these indicators were collected by averaging the scores/rates of the three schools closest to the census tracts centroid. From here, all the scores/rates were transformed into Z-scores to standardize the data. The indicators were weighted and combined to create a comprehensive educational opportunity index of King County.

