We used data from three sources:

The Food Access Atlas, which is produced by the USDA

US Census Data, to determine population changes in counties

Geoapify API, to find supermarket locations

The data we received was country wide and cleaned it up to focus on three regions in CA, Sacramento, Bay area, and Central valley. A little for fun (it’s where we are), but also because they had a good mix of rural, agricultural, suburban and urban areas.

In our analysis, high food desert scores tended to come from counties with smaller populations and are more rural or agricultural.

You can see here in the Sacramento region, the percentage low access scores come from the more rural area.

Sac - Amador 12.13%

Sac - Calaveras 17.17%

Sac - El Dorado 30%

And here, in the Central Valley, the more agricultural counties had lower access with some breaks around the metro areas.

CV - Madera 5.25%

CV - Merced 9.52%

CV - San Joaquin 11.17%

CV – Tuolumne 30%

And you can see the Bay Area is doing pretty well with access on a county level.

The presence of grocery stores and superstores are two of the most important indicators of access to healthy food options, but we didn’t find as strong of a correlation as we expected.

We did find something interesting which was that fast food options stayed more or less constant even as other options, grocery stores for example, decreased. In the second scatter plot, you can see that as in low access increases, fast food options remained the same. Here, we had a p-value of significantly less than .05 and a correlation coefficient of essentially zero (-.01)

Because there wasn’t much in way of correlation between specific types of store declines and low access, we dug deeper and found a moderate correlation with a low p-values between counties with population loss and an increase in low access scores. In addition, there was a moderate correlation with a low p-value between total population and change in low access.

This suggests, that while there are still plenty of communities facing low access in metro areas, rural areas have tended to see the greatest negative impacts of changes over the past decades.

In conclusion, Northern California has seen gains in access to healthy food options. However, most of the gains have been see in more metropolitan areas. In counties with increasing populations and higher incomes, Northern California is doing quite well on a county level increasing the access to healthy food options.

Where we see the most worrying data is in low-income rural populations. Here in Calaveras and Tuolumne counties, you can see the large areas of the county where there are no stores. In many counties there has been frightening decreases in access to healthy options. Even more disturbing is that children under 18 are affected disproportionally.

It was obvious that as the populations of Black, Asians, and Hispanics increased, easy access to healthy food decreased. And yet, there large populations of Whites facing food deserts. Again, we see low-income populations suffering lower access to wholesome options at a higher rate than the rest of their cohorts.

Of all the relationships we explored, this relationship between change in access and change low-income access may have been the strongest.

The correlation coefficient was a very strong (0.93) and while the p-value was not as low as some others, when we expanded the data set to all of California, the correlation remained strong and the p-value decreased considerably to 0.016 with the around correlation coefficient 0.75, so we feel confident the significance of this relationship at the county level.

While it is not surprising, it is important to stress that in almost all the data, low-income populations of the same cohorts, whether by race, age or geography, tended to see lower access to healthy food options than those with higher incomes. While this data has limitations, Northern California’s policy makers should do more to increase access for the populations where economic and food insecurity are at their highest.