

Abstract

Using data from the Substance Abuse and Mental Health Services Administration (SAMHSA), we formed an interactive map of facility locations in the US; filterable by services/medications offered. Facilities were plotted over a county population map, visualizing disparities in the disbursement of treatment centers across the United States.

Introduction/Background

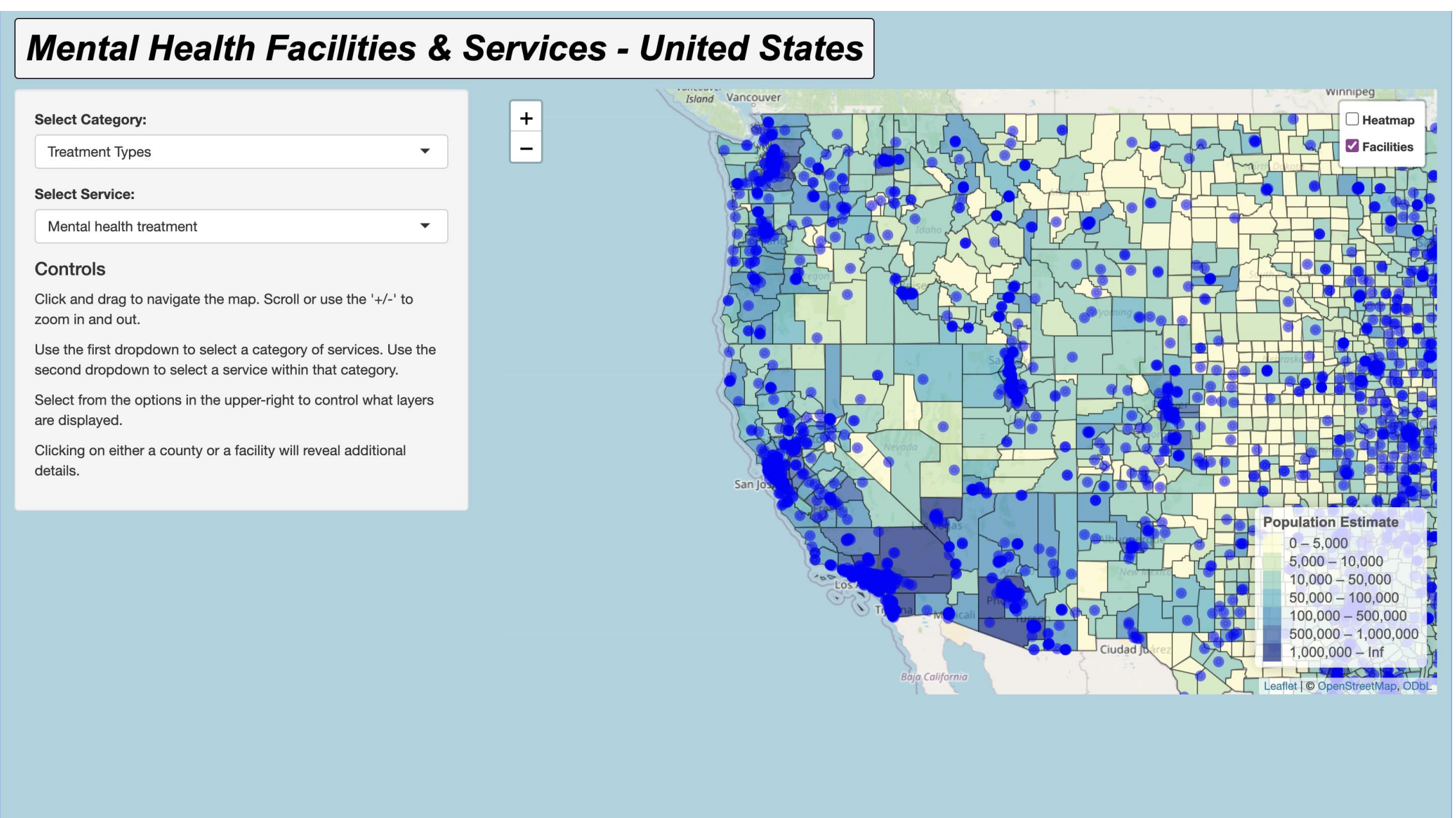
The SAMHSA repository contains data on the name and location of all public mental health facilities in the US. Our goal with this project was to use this data in making a product that allows users to visualize their geographic access to mental health services, and for us to visualize the coverage of certain services – to potentially identify areas that lack access to a given type of treatment.

Research Question/Hypothesis

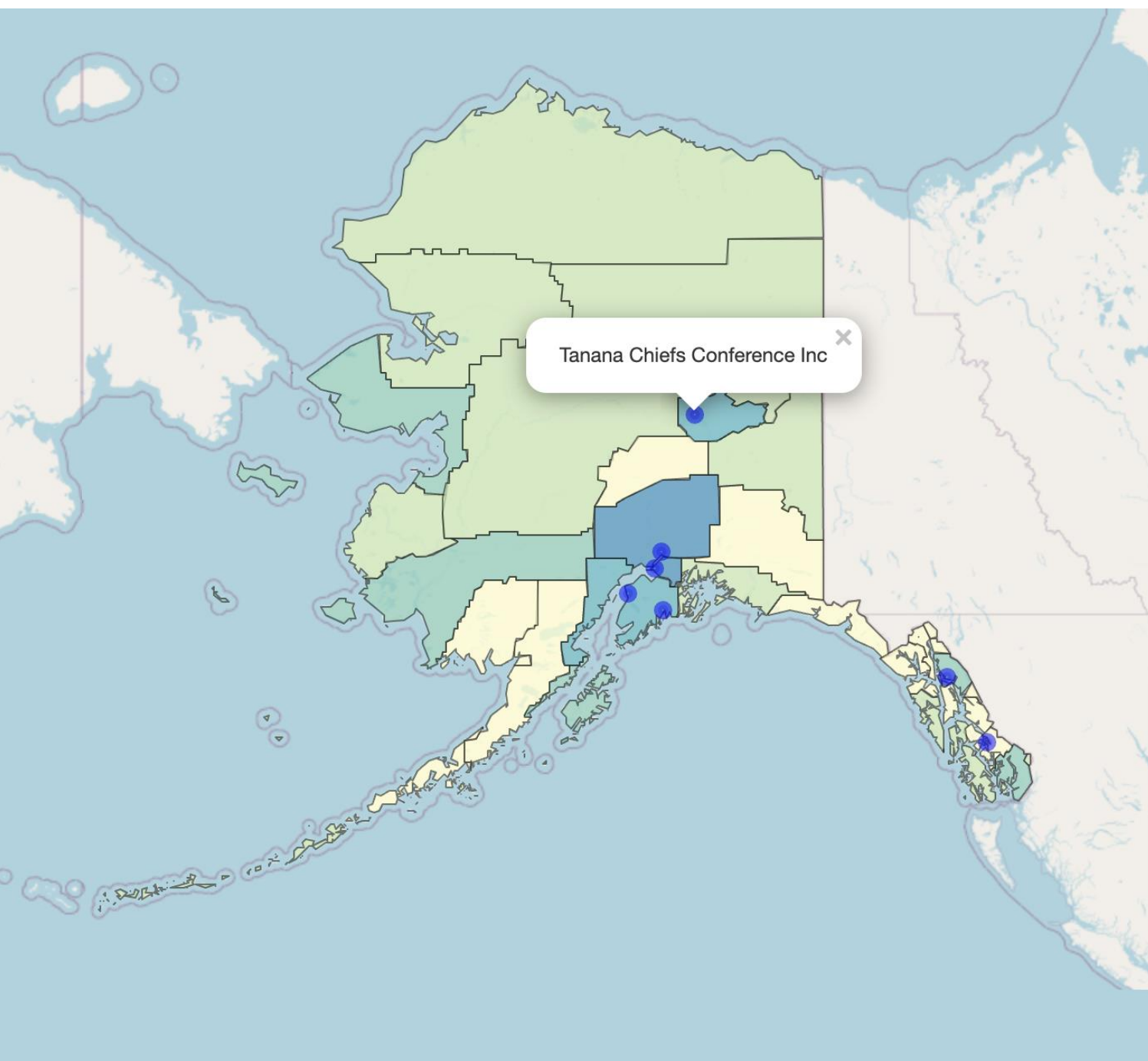
Are there any regions of the US with less-than-optimal access to mental health treatment? Are any of these perceived “mental health deserts” due to population differences? Our goal is to produce a data product to visualize these potential deserts and identify exactly which services are available to a given area.

Methods, Data and Programs, Analytics

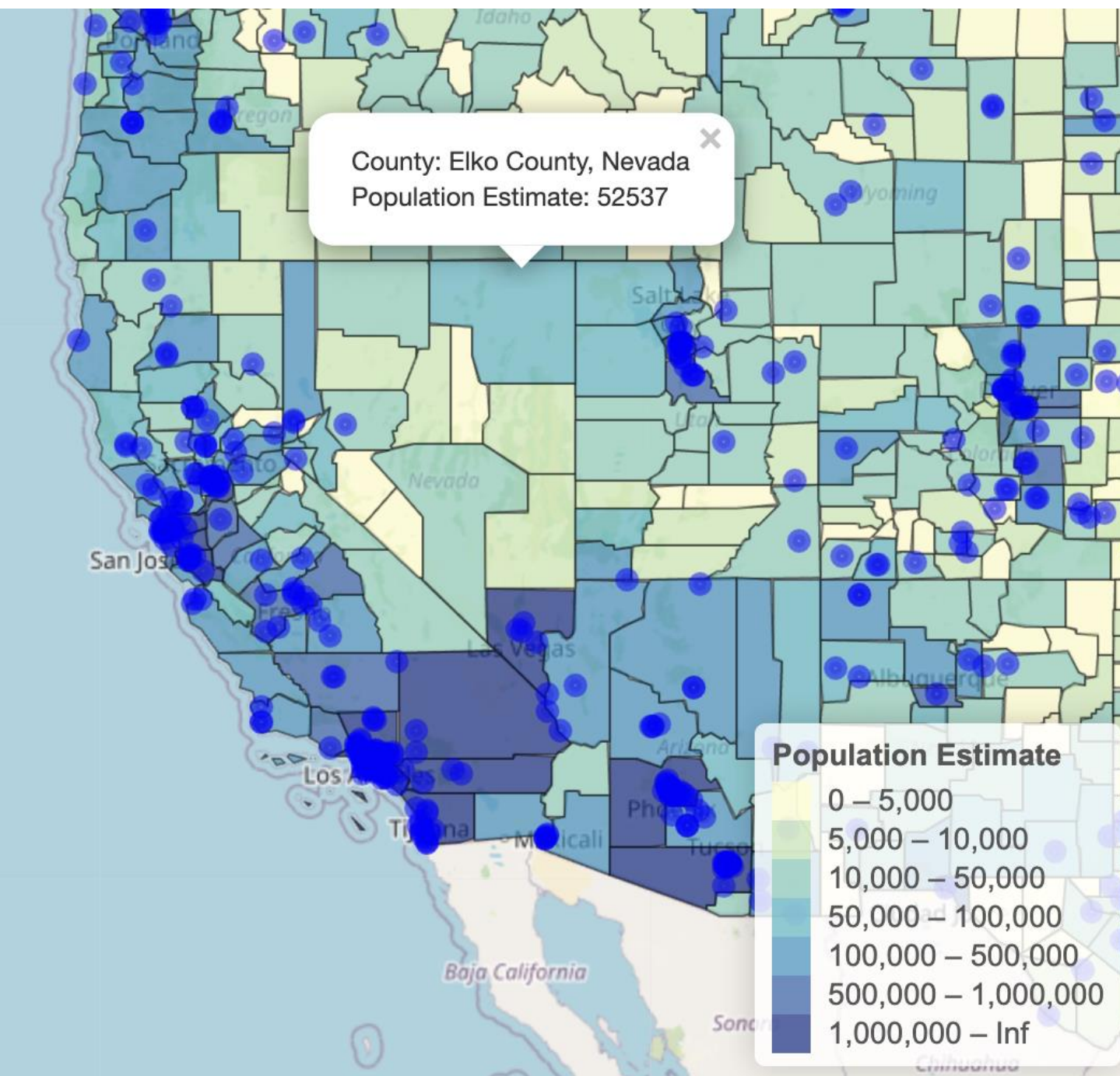
Using RStudio both locally and through the TACC Supercomputer (Stampede3), data from SAMHSA was interpolated using several spatial analysis libraries – primarily ‘leaflet’. ‘tinygeocoder’, and of course the shiny and shinylive libraries were essential in producing this visualization. First, data was extracted from SAMHSA containing facility coordinates, names, and services provided (encoded). Then each service code was manually extrapolated into full definitions, before being merged and used for the map itself in a shiny app. Census data was gathered from the US Census Bureau using ‘tidycensus’ package in R, which included county shapefiles and population data.



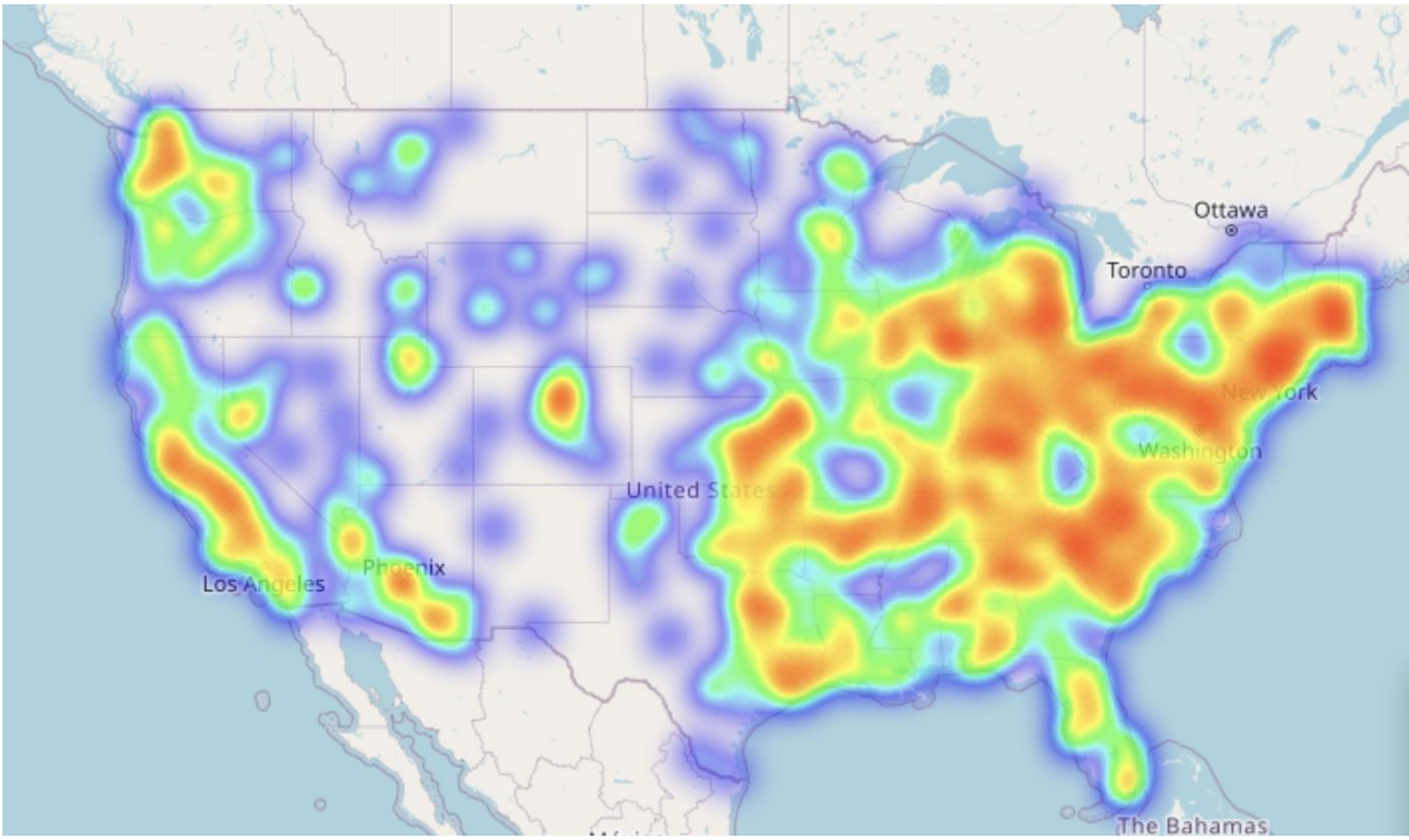
Facilities listed as providing general mental health treatment services, in the western – midwestern United States.



Example output for a search for facilities in Alaska that self-report receiving federal grants as a funding source. Map features facility name pop-up on click.



Example output for a search for facilities providing “housing services” treatment. Map features county name, state, and population on click.



Concentration of facilities listed as providing the anti-schizophrenic medication “Asenapine”.

Discussion

The first stage of this project was concise and straightforward. Manipulation of the data extracted from SAMHSA led to a single data frame that contained the name of each facility, its coordinates, and the services it offers, in an abbreviated format. Challenges arose in containing each facility inside it’s respective county, based on coordinates. Functions from the ‘ST’ package were used to map facilities to counties.

Conclusion/Future Works

The app works as intended for navigating mental health facilities and service availability in the US. Confirming our hypothesis, it led to observations on so-called “mental health deserts”; areas with very limited access to certain services, or facilities themselves. For example, some regions in and around the Nevada area have robust populations, yet a significantly lower concentration of facilities than areas of a similar population density. The next step I would like to take with this product is to employ machine learning in identifying these ‘deserts’ on a more local scale and calculating the best location for a *new* facility. The application would also benefit from being hosted on an actual server, to allow for faster response times when a filter request is made.

References/Acknowledgements

<https://github.com/NSF-ALL-SPICE-Alliance/geo-facility-ml/tree/main>
<https://www.samhsa.gov/data/report/national-directory-of-mental-health-treatment-facilities>

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