MATH 356 Alumni Project

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1 Background

As a private institution, Hendrix relies on donations for much of its upkeep, as well as implementing new projects around campus. Some student scholarships and our new Welcome Center exist due to donations. Donations can also serve as a way for alumni to give back to the institution, share the opportunity of higher education with others, and improve the quality of life for current students living on campus. As a group, we have set out to study potential ways to increase alumni event attendance and donations to the College outside of Arkansas and Texas by targeting other alumni-dense areas around the country.

We analyzed the 2016-2017 alumni data set and pinpointed specific areas of the country where we believe increased alumni engagement will be beneficial to the College. We focused on the intersection of events, alumni location, and alumni age, and the relation of these factors to donations received by the College.

2 Analysis

The majority of our analysis was done using Mathematica. Data cleaning and organizing was done using Python (Spyder), Excel, and SQLite. After spending substantial time perusing the data, we decided to focus on alumni events attendence. Events are an easy way to study alumni involvement. Also, as seen in Figure 1, there is a strong correlation between states' total event attendance and total donation amounts.

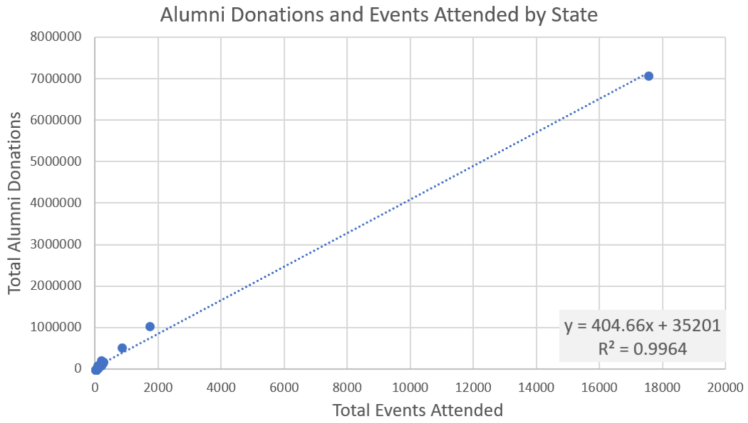

Figure 1: Total Events Attended and Donations Made by Alumni by Each State

2.1 Graduation Year and Alumni Giving

We first examined alumni donations in relation to graduation year. We considered all alumni with valid zip codes in our analysis. When we visualized this data (Figure 2), we noticed an interesting bell curve shape. Most donations came from those who graduated in the 1970s. We can extrapolate from this that the age group of graduates most likely to donate are those in their mid to late 40s. These alumni have been out of college 20-25 years, and have had time to accumulate wealth.

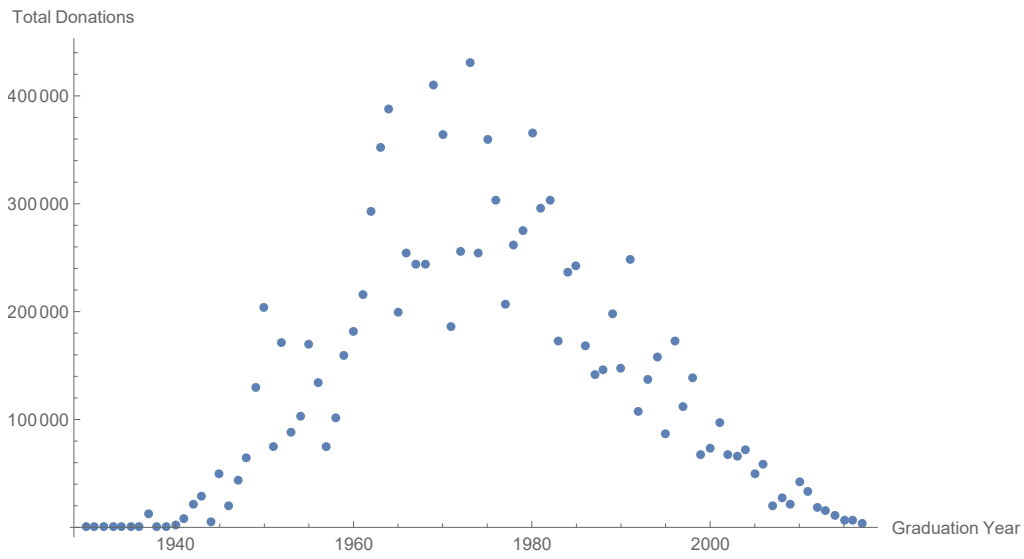

Figure 2: Total Donations by Graduation Year

2.2 Graduation Year and Alumni Locations

In Figure 3, we plotted the volume of alumni moving to specific states post-graduation, separated by decade of graduation year. In each decade, the largest concentration of graduates stay in Arkansas, followed by Texas. However, we found some interesting trends in alumni movement since the 1960s. There has been an influx of Hendrix graduates in California, Colorado, Louisiana, Oklahoma, and Tennessee. Currently, at least 50 Hendrix graduates live in each of these states. We decided to further examine these potential trends in alumni movement. For each of the aforementioned states we plotted the number of alumni living in the state by graduation year, then drew trend lines.

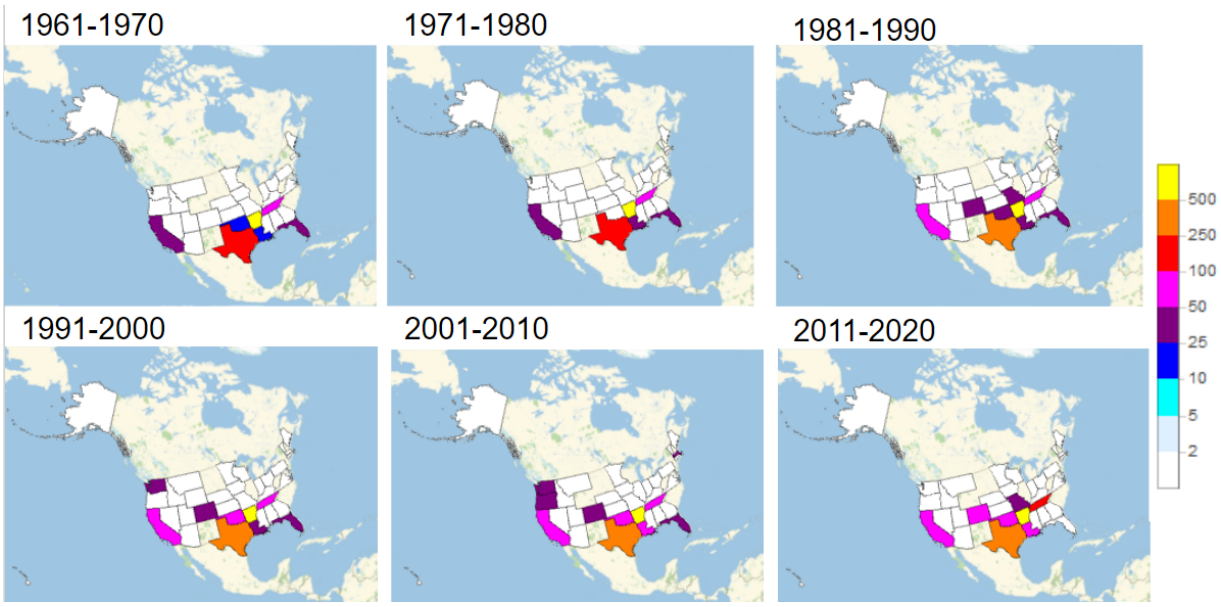

Figure 3: Alumni Location by Graduation Decade

Figure 4 shows population data for California. This state has the tightest trend line, with $R^2 = 0.610297$. Based on the data, we can assume that the number of graduates living in California will continue to increase in a steep linear fashion.

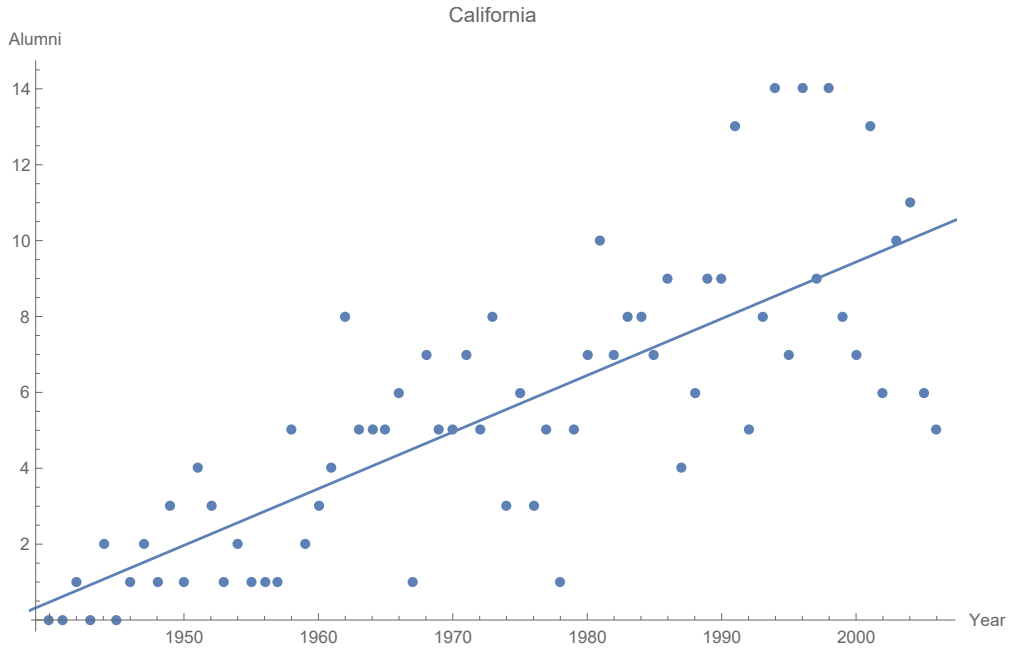

Figure 4: Number of California Alumni by Graduation Year; $R^2 = 0.610297$

Tennessee (Figure 5) has a tight upward trend; R^2 =0.580141. Of the states analyzed, Tennessee receives the largest number of graduates per year.

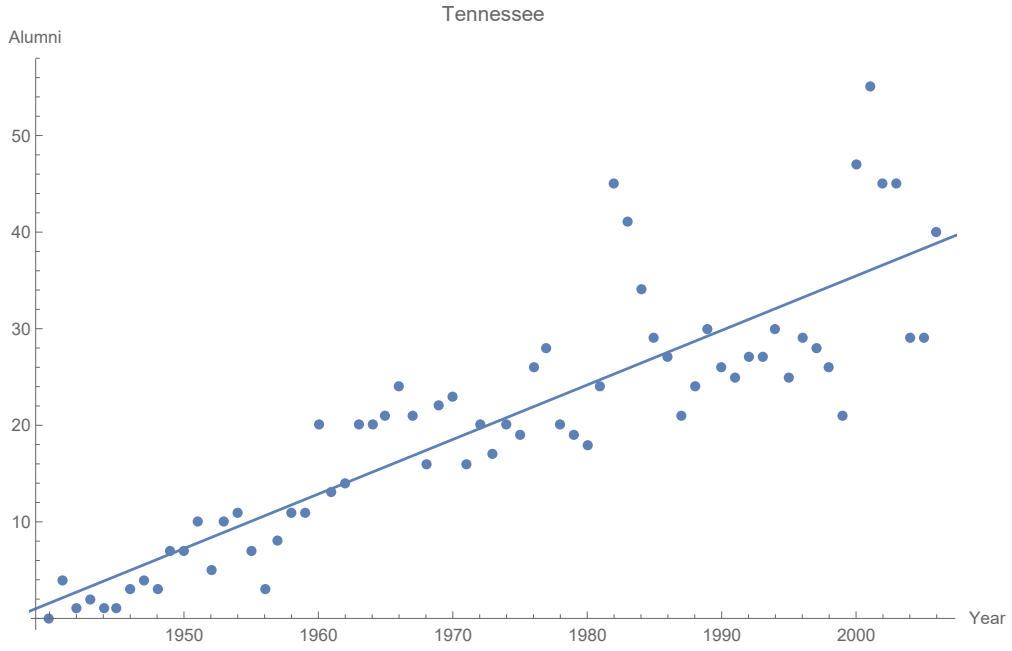

Figure 5: Number of Tennessee Alumni by Graduation Year; R^2 =0.580141

An increasing number of alumni are settling in Colorado, as seen in Figure 6. This growth is projected to continue; R^2 =0.531266.

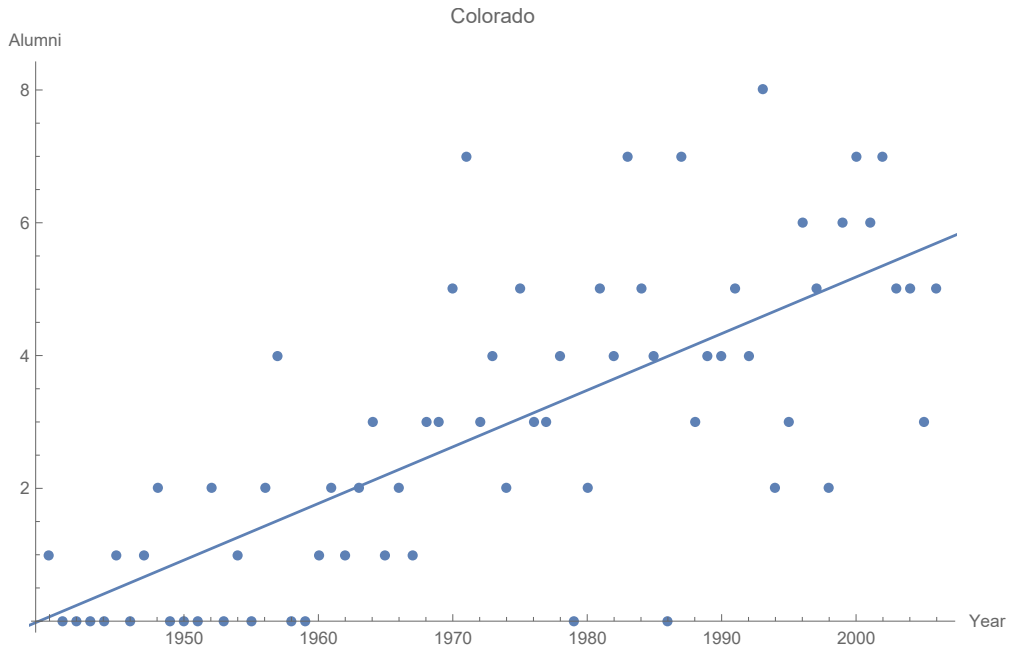

Figure 6: Number of Colorado Alumni by Graduation Year; R^2 =0.531266

Oklahoma (Figure 7) has a greater variance than the previous states, but with R^2 =0.504221 there is still evidence of linear growth.

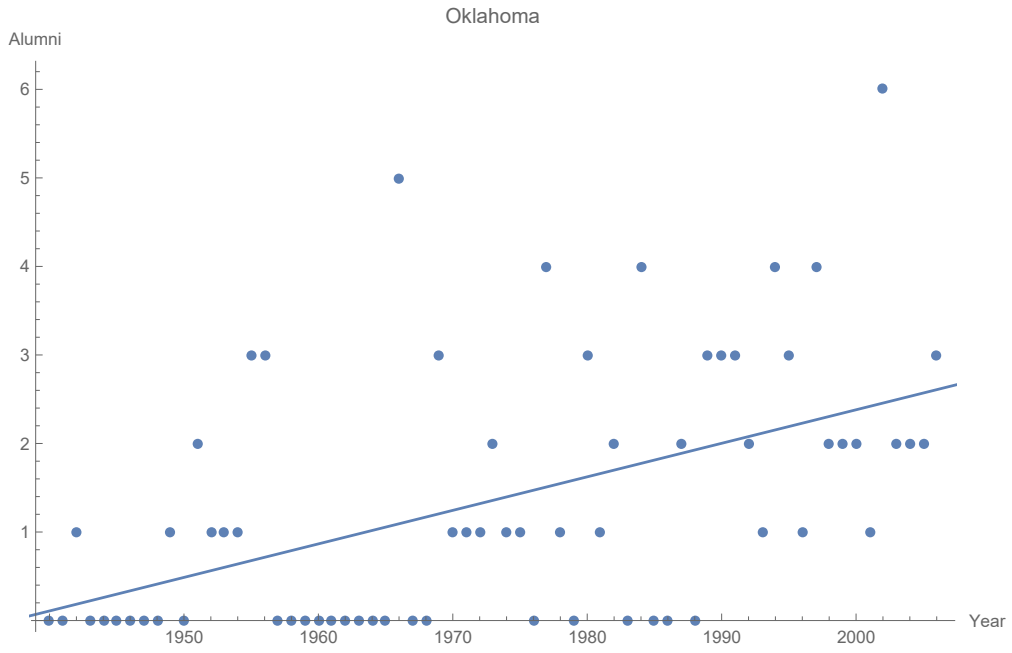

Figure 7: Number of Oklahoma Alumni by Graduation Year; R^2 =0.504221

Louisiana (Figure 8) also shows an increase in Hendrix alumni. However, both the fit (R^2 =0.317938) and slope of the trend line is lower than the other states analyzed.

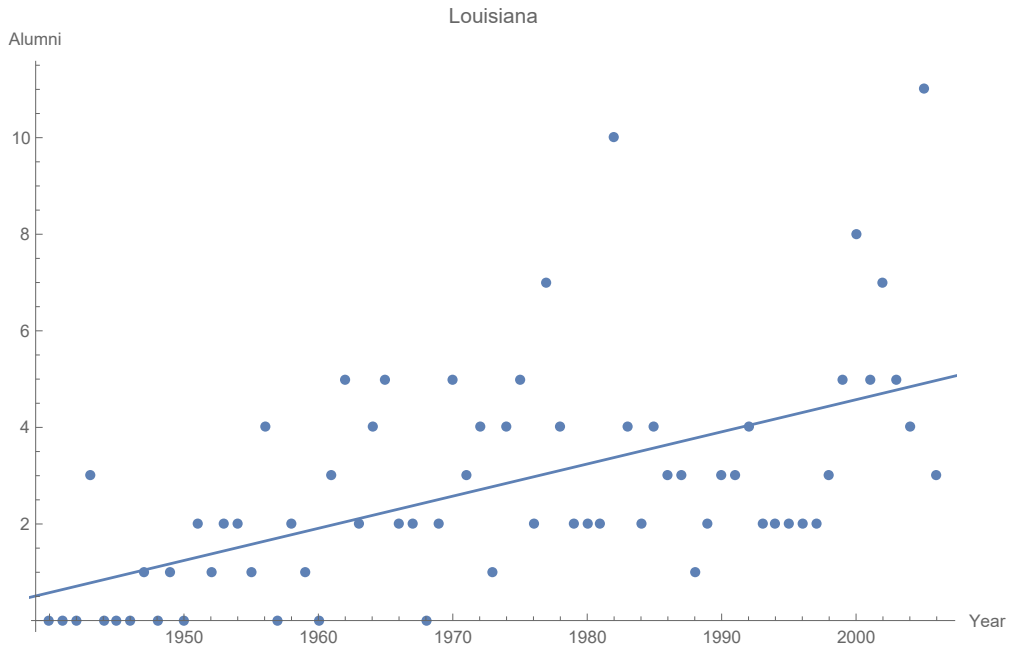

Figure 8: Number of Louisiana Alumni by Graduation Year; R^2 =0.317938

2.3 Alumni Concentrations

We decided to investigate this trend further, and examined where alumni lived in California, based on our data set. We have record of 511 total alumni living in California. In Figure 9, we see that almost all of these alumni live in either the San Francisco Bay area or the greater Los Angeles area.

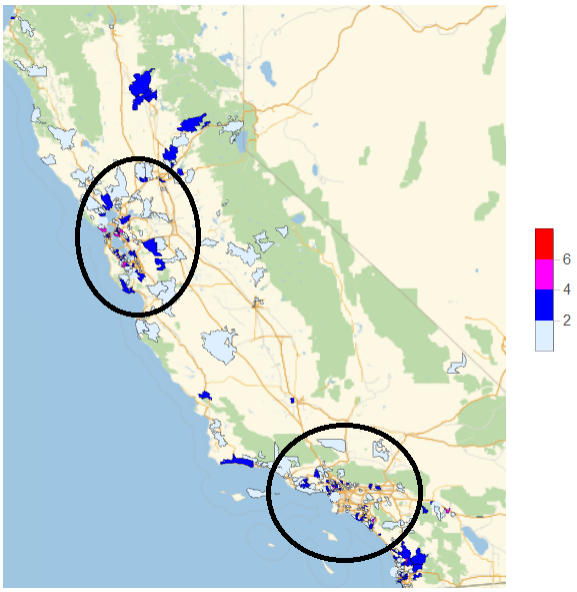

Figure 9: Concentration of California Alumni by ZIP Code

We then conducted a similar analysis with Tennessee, which has a total of 647 Hendrix alumni. Figure 10 shows that most of these alumni reside in the Nashville and Memphis areas.

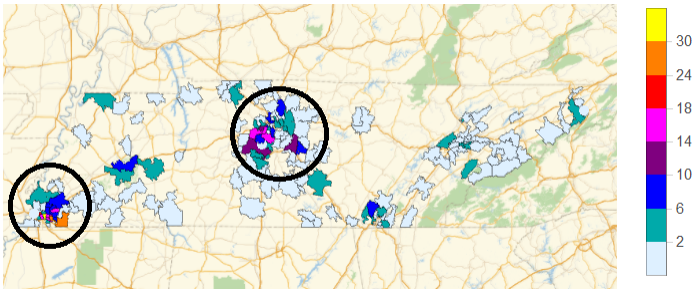

Figure 10: Concentration of Tennessee Alumni by ZIP Code

310 Hendrix alumni reside in Colorado. Figure 11 shows us that most of these alumni are in the Denver area.

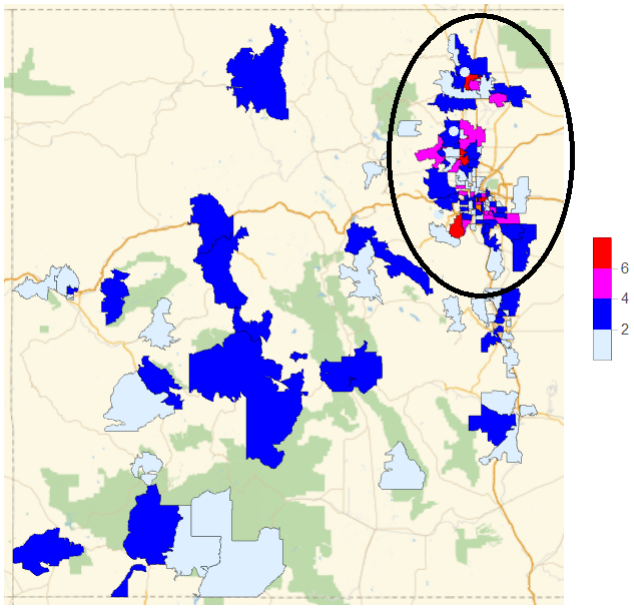

Figure 11: Concentration of Colorado Alumni by ZIP Code

Figure 12 shows the breakdown of Oklahoma-based alumni by ZIP code. There are a total of 334 recorded Hendrix graduates residing in Oklahoma. The highest concentration of alumni are in the Tulsa and Oklahoma City areas.

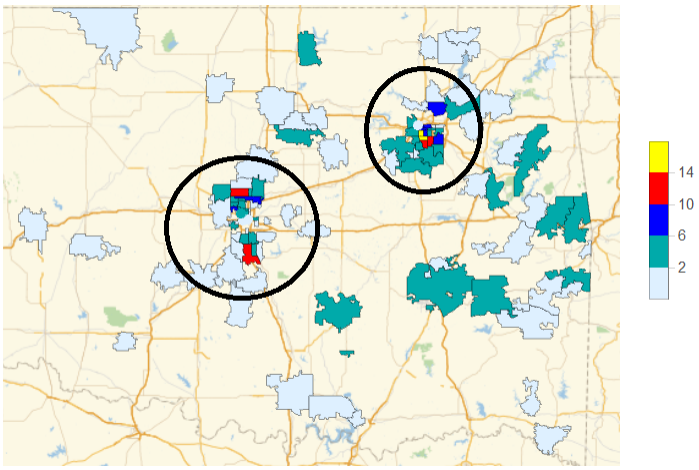

Figure 12: Concentration of Oklahoma Alumni by ZIP Code

Louisiana has a total of 297 recorded alumni. According to Figure 13, the highest concentration of alumni is in the New Orleans and Shreveport areas.

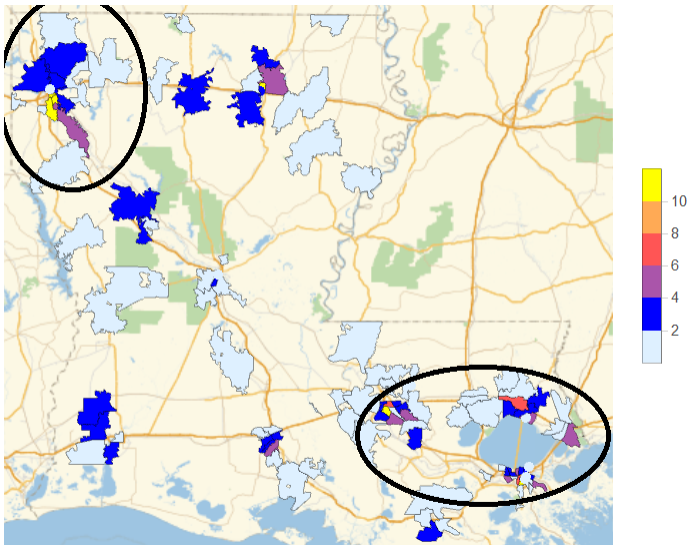

Figure 13: Concentration of Louisiana Alumni by ZIP Code

These areas are key points, because they seem to be places Hendrix alumni are increasingly moving to post-graduation. This could be due in part to an increased focus on attracting out-of-state students. In any case, these areas would be prime targets for alumni events, which could both increase alumni support and increase enrollment from out-of-state students.

3 Policy Suggestion

As seen in Table 1, events held for Hendrix alumni are primarily concentrated in Arkansas and Texas. Of the events in Arkansas, 163 were in Conway and 44 were in Little Rock. It makes sense that many alumni events are held at Hendrix. However, the lack of events in other regions of the country may discourage alumni outside of Arkansas from attending events and engaging more with the College.

Table 1: Cumulative Events by State

State	Number of Events
AR	256
TX	27
TN	15
DC	6
MO	4
NY	3
GA	2
CA	2
AK	1
IL	1
MA	1
OK	1
WA	1
MN	1

The goal of identifying trends in the data was to be able to predict future alumni behavior. We have seen that alumni who are 20-25 years out of college are more likely to donate to Hendrix. It would be advantageous for the college to begin targeting alumni who are approaching this age range. Since alumni are becoming more dispersed from the Arkansas and Texas areas, we have also identified several states that have rapidly growing alumni populations. Within these states, we found the areas with the highest alumni concentrations. Based on these findings, we recommend that the College consider hosting events in the following cities:

- San Francisco, CA
- Los Angeles, CA
- Denver, CO
- Shreveport, LA
- New Orleans, LA
- Memphis, TN
- Nashville, TN
- Tulsa, OK
- Oklahoma City, OK

By hosting alumni events in areas outside of Arkansas and Texas, Hendrix will be able to gain support from an ever widening network of alumni. We predict that this will lead to increased donations to the college as alumni in these areas become increasingly established in their respective fields.