Measuring Preference in Food Locations on Humboldt State University Campus

Final Project

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Humboldt State University
Introduction

College is a time for great experiences, making new friends, and being stressed out, which is a part of the unadvertised curriculum for most students. The last few weeks of the semester on Humboldt State University are often referred to around campus as “hell week”. It is a time of great stress and often neglect of personal health for the students because of the great stress put on by finals. The current quality of food in most public schools as well as on university campuses is typically very low in and actually unhealthy (Finklestein et al. 2008). As many as 45% of students living both on and off campus bought food 3 times a week from vending machines, cafeterias, restaurants, and other locations on campus (Laska et al. 2010). Typically these food sources are poor nutritional value and vending machines are almost entirely stocked with fat or sugary snack food that may lack nutritional value.

The purpose of this assignment was to design a project that would both improve my observation/data recording skills as well as my basic knowledge of the program ArcMap and its elements. By observing how many people purchase something at each local eatery on campus and downloading collected waypoints from our portable GPS units at each area on campus that sells both food and drink, I can use visual hierarchy in a map to display the areas of greatest food purchases. I assume to find that students, during times of stress, will favor vending machines and coffee tables rather than the hearty food locations that can be found around campus.

The goal of my project was to see if there was a specific kind of location on HSU campus where food and beverage were both available that student’s preferred during finals. For example, I wanted to see if the convenience of the vending machines made them more desirable in areas of heavy foot traffic or if proximity to specific buildings played any role? I measured the volume of guests who purchased food related items at their locations by physically counting the number of
guests at the locations on Humboldt State University campus where both food and drink were sold.

**Methods**

The first task was to find all the locations that sold both food and beverage with the highest areas of student population density on campus. I settled on 8 locations throughout campus that were comprised of cafes, clubs that sold food and drink, the market store, and vending machines. If someone could buy a potential meal there, I wanted to record how many individuals did. When I arrived at each waypoint I marked it with the Garmin GPS by hitting the mark button on the receiver. The waypoints were actually recording UTM’s, which were downloaded, to make it easier for programs such as ArcMap to reference them using international grid lines uploaded and organized.

The attributes in this experiment were time of day and number of individuals who purchased something. I was curious to see if there was a pattern of behavior that was dependent on any environmental factors such as building proximity to the location. The data collection took place over 3 school days, each location was observed for 30 minutes and number of guests who exited the establishment with a purchased food or beverage item was tallied and totaled.

I chose the 30-minute period of observations because there were 8 total locations to visit each day. I chose this time because it worked best with my schedule the busiest times on campus are typically early morning between 8:00am and 12:00pm. When considering consistency in data collection, I decided to collect my data a total of three days, back to back, which was to see how the students would choose their food in a stressful environment, due to “hell week”.
After data collection I needed a way to show the difference in the volume of individuals buying food or drink that I had counted at the different locations. This is when I uploaded my waypoints into ArcMap and downloaded the waypoints information from the Garmin GPS unit and put the attribute table from it into an excel file. The excel file was then cut down to two columns, waypoint number and volume of guests per location. Then I assigned each waypoint a graduating numeric value 1-5 to show the varying degree of people that purchased food from that location. This allowed me to quantifiably demonstrate on a map which types of locations that the students mostly purchased their meals on campus.

I chose to display a map of Humboldt State University as my base map that was retrieved from the HSU data hub and also added buildings on campus to illustrate where areas of greater density might be on campus are suspected to be because of proximity to buildings and larger classes. Yellow points indicate the waypoints so that there is contrast/hierarchy between the map, the location, the buildings, and size of the waypoint.
Results

Table 1. Shows the amount of guest that purchased either a food or beverage from a designated location on Humboldt State University campus from 11/28/16-11/30/16. The time and school days in which the data was collected was also recorded to show the student populations at the given times.

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Day 1(Mon)</th>
<th>Day 2 (Tues)</th>
<th>Day 3 (Wed)</th>
<th>Total Guest</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00am</td>
<td>The Market</td>
<td>22</td>
<td>18</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>8:30am</td>
<td>Behavioral Science Bldg Store</td>
<td>11</td>
<td>15</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>9:00am</td>
<td>CU Coffee Table</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>9:30am</td>
<td>Vending Near Pool</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>10:00am</td>
<td>Vending in Founders Hall</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10:30am</td>
<td>The Depot</td>
<td>27</td>
<td>20</td>
<td>18</td>
<td>65</td>
</tr>
<tr>
<td>11:00am</td>
<td>Library Cafe</td>
<td>16</td>
<td>20</td>
<td>15</td>
<td>51</td>
</tr>
<tr>
<td>11:30am</td>
<td>Food Pantry</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Scale of yellow dots range from sizes 1-5 on the Map displayed below and are broken down into the following size ranges.

60 guest or above = 5
40-59 guests = 4
15-39 guests = 3
6-14 guests = 2
1-5 guests = 1
**Volume of Students Purchasing Food at Different Locations on Campus**

Figure 1. The following map is of Humboldt State University campus and it illustrates the preference of students regarding where to buy their food and beverages. The data was collected on Monday November 28\(^{th}\) until Wednesday November 30\(^{th}\) by surveying from 8am to 12pm around different locations on campus. The larger the size of the yellow dot indicates a great number of students bought from that location and the smaller indicates a low number of students who purchase their food at that location; The green squares represent buildings on campus.
I observed that students tend to select against vending machines and more at the places with a generally larger selection of food or drink, as well as close to the larger buildings. The Market and the Depot were the most overwhelmingly preferred locations on campus that students visited, which makes sense because they also have a wider selection of foods to offer. It may also be the case that the times of day that I observed each location was at a particular time when more students may have been in class on average. The type of weather could also highly affect the amount of people present at the different food locations as well. Tuesday was the only day it was not raining for most of the morning and no unusual change in individuals were measured besides at the market.

**Discussion**

This project gave me a better understanding of how to go out in the field and design my own experiment and illustrate my data on a map using ArcMap. The data collected was about what I expected it to look like with the short amount of time I spent collecting it. It should have been efficient with the given amount of data, but more research could be done on days not so close to finals; which may have given us different results. This project was a great eye opener in learning how to collect data and how to improve on arranging and illustrating your point through it. The only thing that I would probably do different is account for the different elevations of each location on campus to see if the higher the elevation would have lower number of individuals purchasing food and drink items.

This data suggest that at least on Humboldt State University campus students tend to stay away from the more sugary and fatty selections of food typically found in the vending machines. There could definitely be some sampling errors due to the fact that I was the only one collecting the data. This limits the areas I can be in different locations at once and increases the chances of user
error. However, Arcata is a very progressive town and has had many pushes in more eco-friendly initiatives as well, such as banning plastic water bottles from campus. After conducting this study, it would be nice to have at least 4 observers counting the individuals at 2 locations instead of just me running around to all 8 in 4 hours. This way longer studies on each location could be conducted instead of the limited 30-minute window so I could physically make it to each location. I feel this limited the accuracy and precision of my results dramatically because for large portions of that time that I am recording data there are classes getting out and starting up in different locations. I would propose not only longer periods of observations, such as 1 hour instead of 30 minutes, but with more observers to collect field notes. This would give a much more accurate number because it would be repeated the same way and more efficiently.

While in my GSP 270 class next semester I hope to learn how to add more variation among my data points to reference many attributes instead of just 2 for this project In the future I would also like to have more time spent collecting my data so that I can have a greater sample size to work with. This could also be a way to differentiate the different food and drink locations that students actually prefer rather than just the locations that I was limited to. This final project has given me the basic knowledge to go out and be able to conduct my own individual research as well as for my senior project next year.
Literature Cited

http://pediatrics.aappublications.org/content/122/1/e251

Humboldt State University Data Hub. 2016. HSU Campus [Date file]. Retrieved from
http://gis.humboldt.edu/cwis438/Websites/HDH/DataSet_Info.php