Group Members: Ben, Cassidy, Julie, Sam, Charles, Tina, Kimberly

Free Food For All - Visual Report

Introduction

Free Food For All is a nonprofit in the Greater Seattle Area that aims to increase awareness on individual and societal waste. A large part of their efforts go to redistributing and recovering surplus food from vendors and grocery stores to those in need.

Through the use of data visualization, our project means to showcase the quantifiable work that Free Food For All has accomplished. It's in our hope that the public and all people/organizations involved with Free Food For All see the impact made by the organization.

Overview of the Data

Free Food For All collects many data points relating to the receiving of food from donor stores, and the distribution of food through multiple programs. Most of the data came from form submissions by volunteers, who recorded various data points at their collections/distributions.

Some relevant data points include:

- Pounds of Food Collected
- Sources of Food Donations: The grocery stores/organizations that have donated food.
- Pounds of Food Distributed: Amount given out to community members at events
- Sites Where Food was Distributed: events, foodbanks, and other sites where food was given out
- Pounds Composted
- Type of food from Amazon Donations, and how much: Amazon donations were classified by type of food (ex. Prepared Foods, Meat, Dairy, Produce, etc)

Challenges with the Data

We faced some challenges in working with the data, such as inconsistencies and the need for data cleaning to ensure accuracy before finalizing our visualizations. We encountered several obstacles while working with the data, including estimated figures rather than exact numbers and incorrect inputs of data for destinations, locations, and data from pickup personnel. To mitigate these challenges, we maintained open communication with Free Food For All and used our best judgment to address these issues.
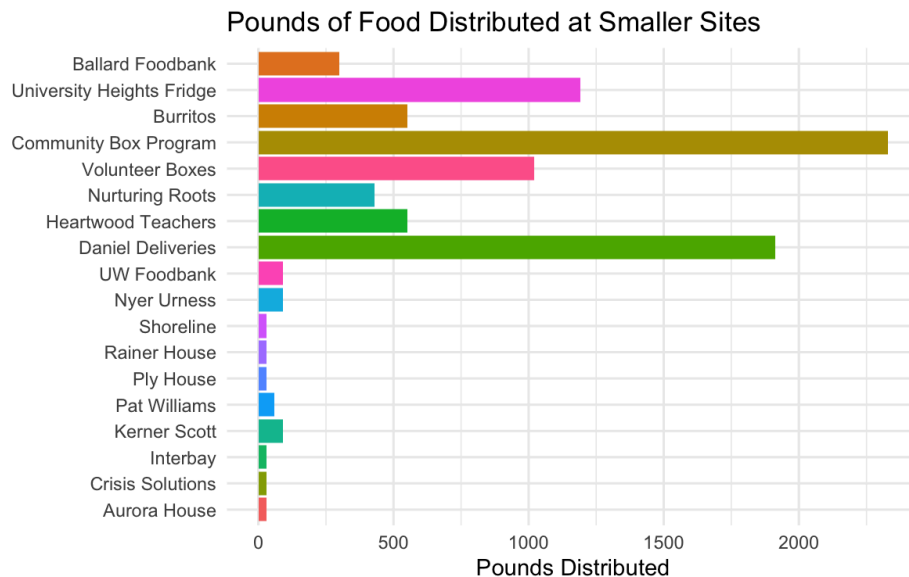
Graphs:

- Graph #1: The presented graph illustrates the locations and frequency of food pickups by Free Food For All during the months of January through May.
  - Throughout the months of January to May, it is evident that Central Co-op was the primary source of food pickups for Free Food For All, with April seeing the highest volume. Additionally, the data shows that Free Food For All made an equal number of pickups from Amazon Jackson and Amazon Pike, although in May, the latter saw a slightly higher frequency of pickups. Along with Amazon Pike's increase in May, Trader Joes also sees a higher than usual frequency of pickups.
  - Takeaways: The graph depicts the frequency and locations of food pickups by Free Food For All from January to May. Central Co-op was the primary source of food pickups for Free Food For All throughout this period, with the highest volume recorded in April. Free Food For All made an equal number of pickups from Amazon Jackson and Amazon Pike from January to April. However, Trader Joe's saw a higher frequency of pickups than usual during this period, along with Amazon Pike's increase in May.
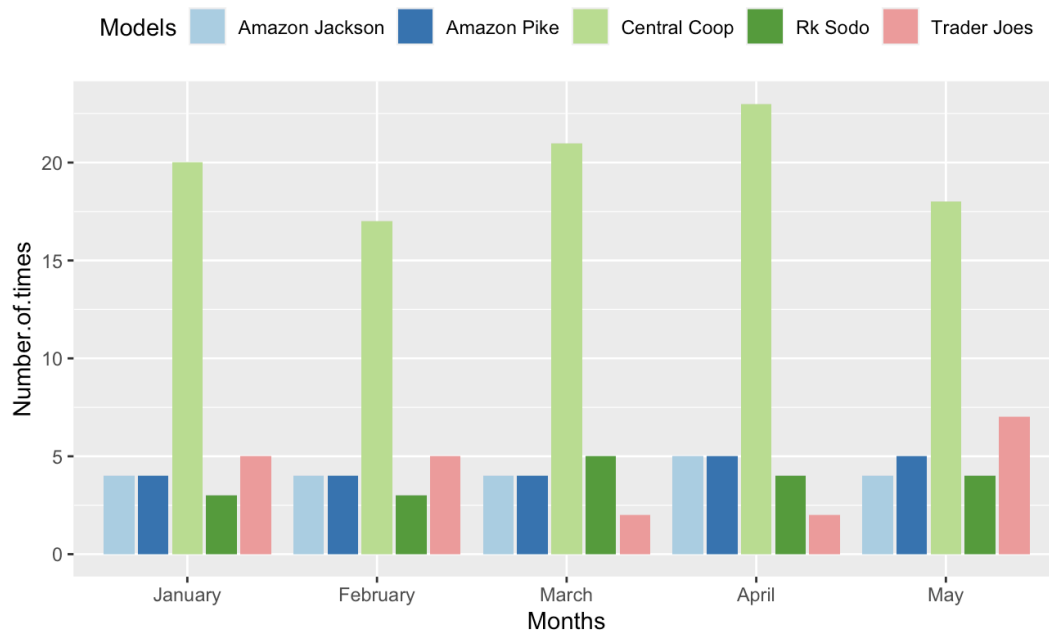
Food Distributions by Location
- Graph #2: This graph displays the amount of food distributed by the smaller sites (in terms of pounds distributed)
  - The amount of food in pounds distributed at each site in 2022 is shown, split up into larger volume donation sites and smaller volume donation sites. The distribution sites were split as some sites have relatively large amounts distributed, but others have relatively low amounts that would be lost in a comprehensive graph.

Pounds of Food Distributed at Smaller Sites

- Graph #3: This graph displays the amount of food distributed by the larger sites (in terms of pounds distributed)
  - The amount of food in pounds distributed at each site in 2022 is shown, split up into larger volume donation sites and smaller volume donation sites. This was done as some sites have relatively large amounts distributed, but others have relatively low amounts that would be lost in a comprehensive graph. Any sites not included in the bars are in the "other" category, whose amount is indicated in the caption of the Larger Sites graph.

Pounds of Food Distributed at Larger Sites

252,279 pounds distributed at other sites (not including smaller sites)
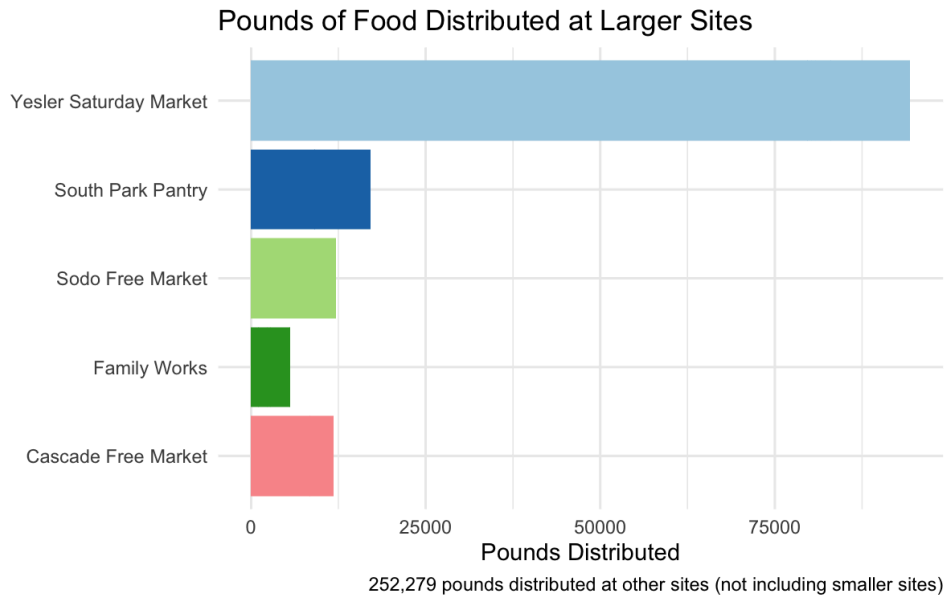
- Key Takeaways:
- Free Markets are the largest by volume distribution sites
  - Yesler (94,405 lbs)
  - Sodo (12,105 lbs)
  - Cascade (11,758 lbs)
- However, since the other category is so large (252,279 lbs), Free Food for All mostly distributes to many small sites

- Graph #4: This graph shows the amount of food collected vs. the amount of food composted in pounds from May-December.
  - The graph is only based only on data where both pounds of food collected and composted from a pickup location were provided since some data provided how much food was collected but not how much food was composted. Due to these constraints in order to not skew the visualization, most of the data comes from the Central Coop pickup location.

Food Collected vs. Compost per Month
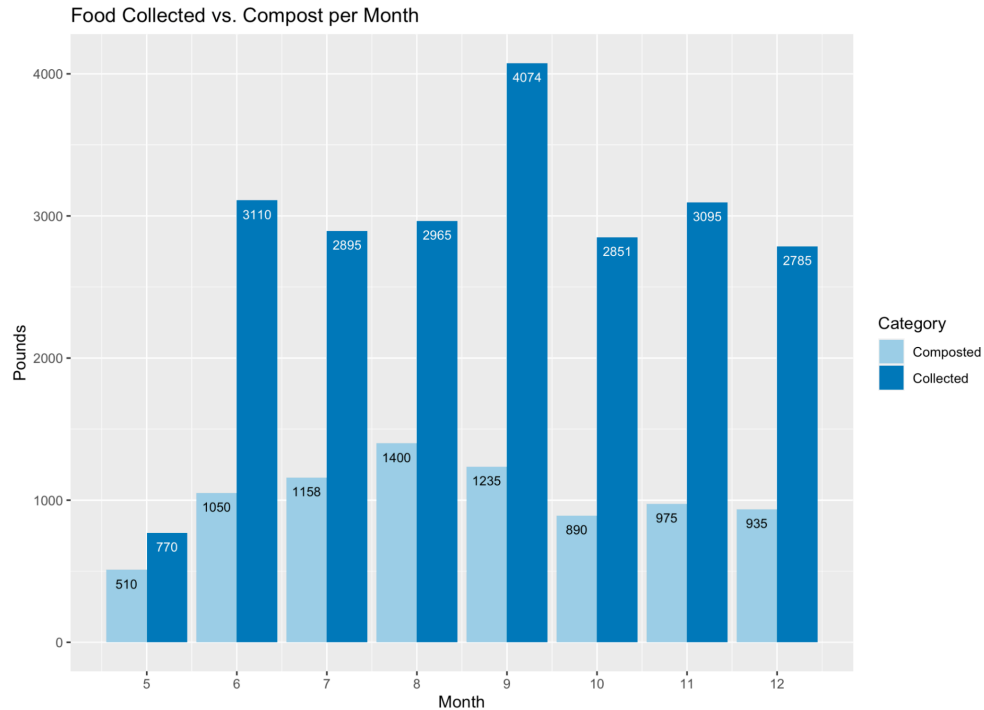
- Key takeaways:
    - The month with the most compost was May, where 770lbs of food was picked up and 510lbs was composted, making 66% of the food collected being composted
    - However, on average, 39% of the food collected was composted throughout the 8 months
    - The visualization shows that May is an outlier with both amount of food collected and composted along with the percentage of food composted but the following months are more consistent

- Graph #5: This graph addresses the total amount of meals distributed between the months of January through December.
    - Looking at the graph, we are able to see the maximum and minimum values, with April having the highest number and December with the lowest amount of pounds collected
    - Key takeaways:
        - The average amount of food collected per month is 33,426 lbs
        - For 7 of 12 months, above 30,000 lbs of food collected
        - For 11 of 12 months, above 20,000 lbs of food collected
        - Skewed right pattern

**Food collected per month (pounds), excluding Amazon**
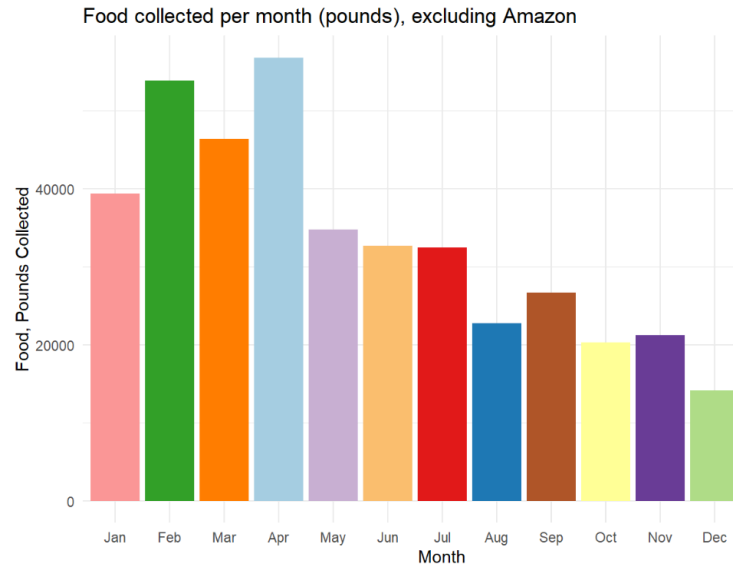
- Graphs #6-9: These graphs sum the amount of food collected each month (or the rolling averages/sums for a 14/30 day period).
  - Some inconsistencies in averages due to uneven distribution of *days* themselves - for example, in February, the 5th, 12th, 19th, and 26th - all Saturdays - each see large swells of donations.
  - Key takeaways:
    - This graph shows the
    - We can see that Free Food For All is collecting around 500 pounds of food or more per day for a stretch from April 2nd all the way through October 9.
    - April through July most active, followed by February. However, that series of events in February was responsible for more food waste prevention than the entirety of December.
  - These are each different ways of visualizing the same general trend - 30 days is less noisy than 14, but the same general trends hold.
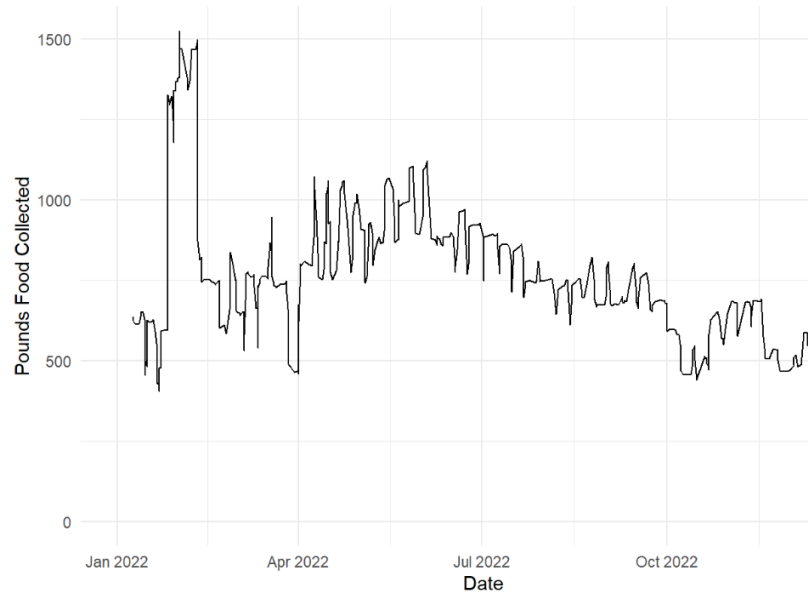
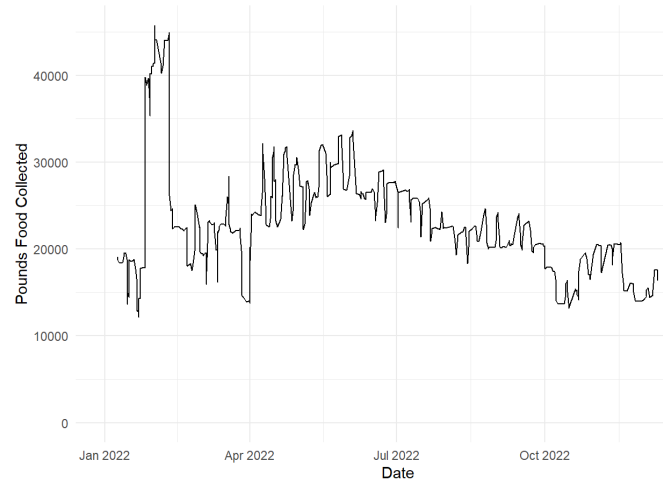## Rolling 14-day average, pounds of food collected
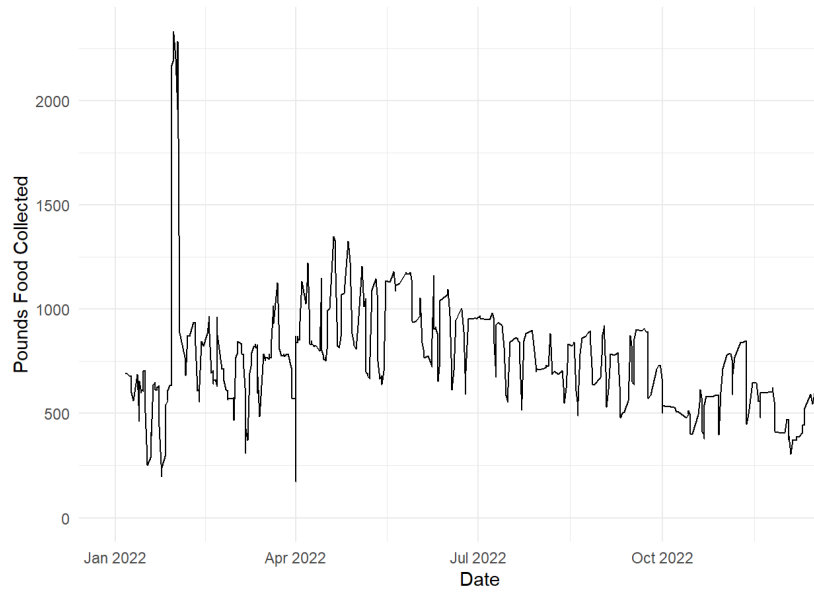
## Rolling 14-day sum, pounds of food collected
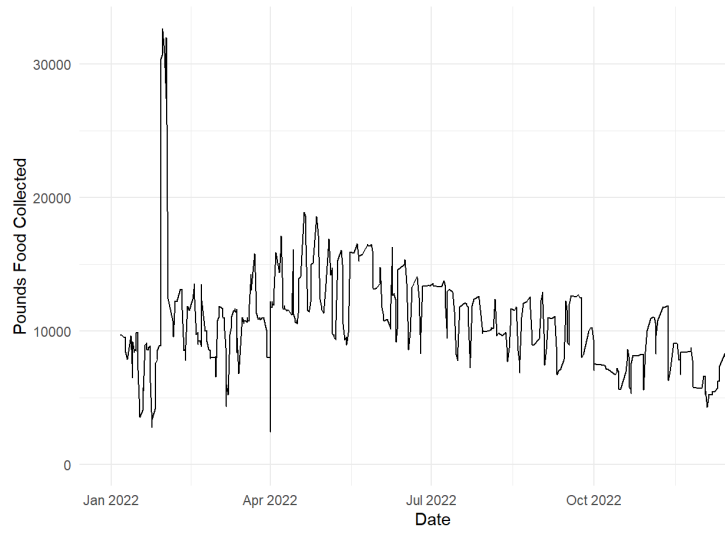
Rolling 30-day mean, pounds of food collected

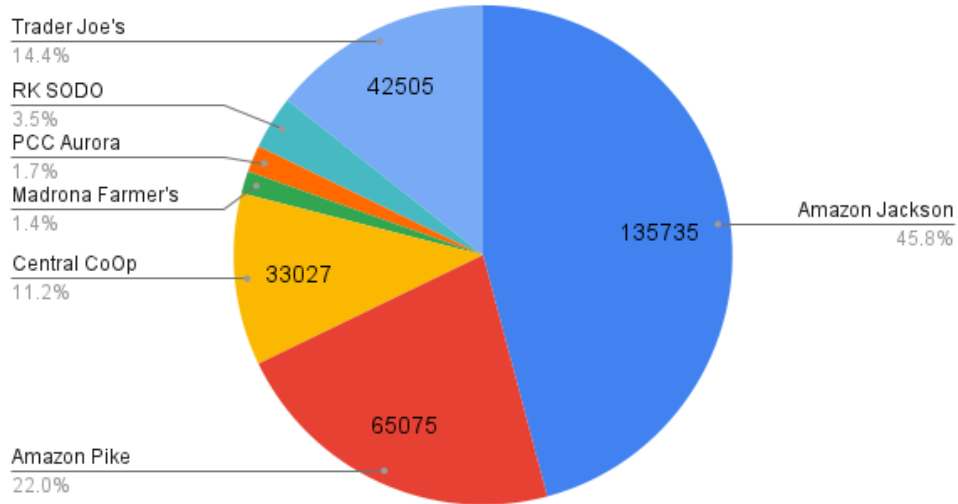Rolling 30-day sum, pounds of food collected

- Graph #10: This graph displays the total amount of food collected in pounds converted to metric tons and MTCO2E (carbon dioxide equivalent)
  - This graph shows the calculations of the total amount of pounds converted to metric tons and its carbon dioxide equivalent (MTCO2E). "CO2e" is a measurement unit that stands for a quantity of greenhouse gas (GHG) that has been normalized to have the same atmospheric impact as one unit of carbon dioxide (CO2), using the gas's global warming potential (GWP) as a reference.
  - This is relevant because it allows for the comparison of emissions from different types of greenhouse gasses on a common scale, based on their global warming potential. By expressing emissions in MtCO2e, it becomes easier to assess the overall impact of different sectors and activities on climate change. It also enables countries and organizations to track and report their progress in reducing emissions, as well as to set targets for future emissions reductions. Basically, the use of MtCO2e is an important tool for managing and mitigating the impact of greenhouse gas emissions on the environment.
- Key takeaways:
  - The maximum value is from Amazon Jackson where the value is rounded to 67.68 metric tons which is equivalent to 135,735 total pounds.
  - Amazon Jackson is also an outlier that fell out of the expected range, making the visual distribution follow a skewed left pattern
  - The minimum value is from Madrona Farmers Market with 2 metric tons, which is also equivalent to 4135 total pounds
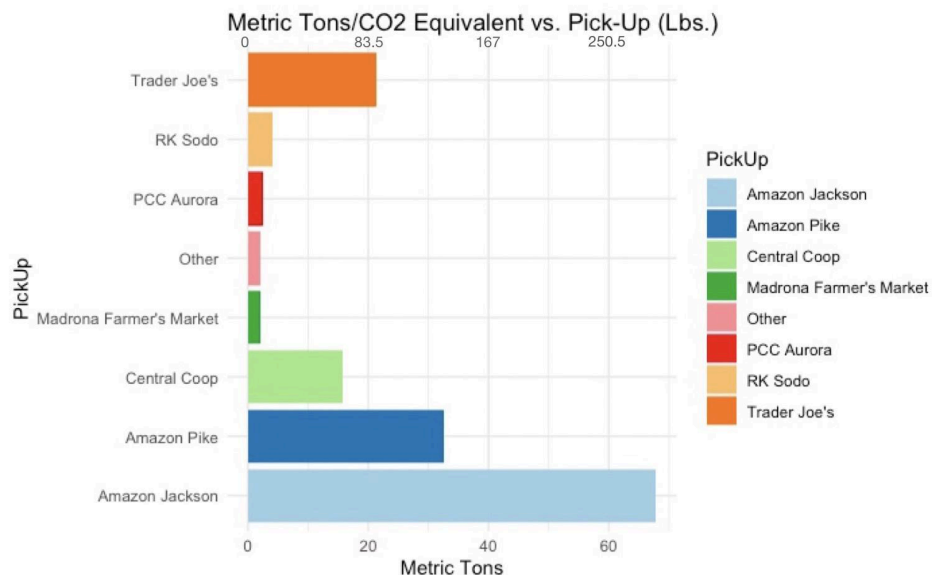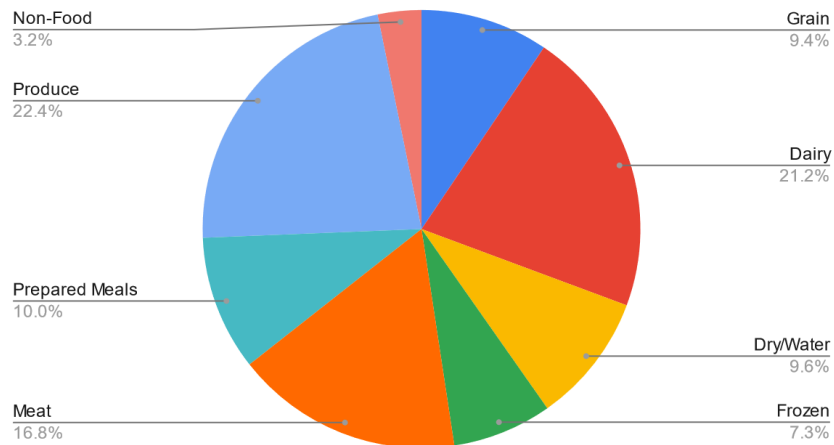
- Graph #11: This graph display the weight estimates of food in picked up in 2022, grouped by source
  - Pickups that do not fit in any of these categories are not shown, and make up less than 1% of the overall pickup volume.
  - (Include key takeaways)

Pounds

Source	Percentage	Value
Trader Joe's	14.4%	42505
RK SODO	3.5%	
PCC Aurora	1.7%	
Madrona Farmer's	1.4%	
Central CoOp	11.2%	33027
Amazon Pike	22.0%	65075
Amazon Jackson	45.8%	135735

- Graph #12: This graph displays the breakdown of the different pallets Amazon donates
  - This graph illustrates the breakdown of pallets donated from Amazon Pike, Jackson, and Ava.
  - This data visualization helps to understand the contents of the pallets that the organization deals with, highlighting the categorical breakdown, represented by percentage, to better understand the contents.
    - From this visualization, it can be seen how Produce, Dairy, and Meat seems to be the top three food categories that make of these pallets that Amazon donates.

Breakdown of Amazon Pallets by Type (Total: 161.25)

Non-Food
3.2%

Produce
22.4%

Prepared Meals
10.0%

Meat
16.8%

Grain
9.4%

Dairy
21.2%

Dry/Water
9.6%

Frozen
7.3%

Conclusion

In conclusion, data visualization has played a significant role in showcasing the measurable impact of Free Food For All. Our project aimed to provide an effective means of presenting the organization's achievements to the public and all stakeholders involved. We believe that through our efforts, people will recognize and appreciate the significant contribution made by Free Food For All in addressing food insecurity. We hope that this visualization of data will inspire continued support for the organization's noble cause and encourage more people to get involved in the fight against hunger.