

# Team Number: DC20075

## Dataset: Ocean Cleanup

Connor Howard, Christopher Smith, Yixin Ye

<https://github.com/privat33r/dc20075-ocean>



# Assumptions About Dataset

1. Each piece of garbage collected was a whole piece
2. Each person in a group does equal amount of work
3. Each person only participated in one event
4. Each person walks and picks up trash at same pace (distance =  $k \cdot \text{time}$ )

# Data Preparation

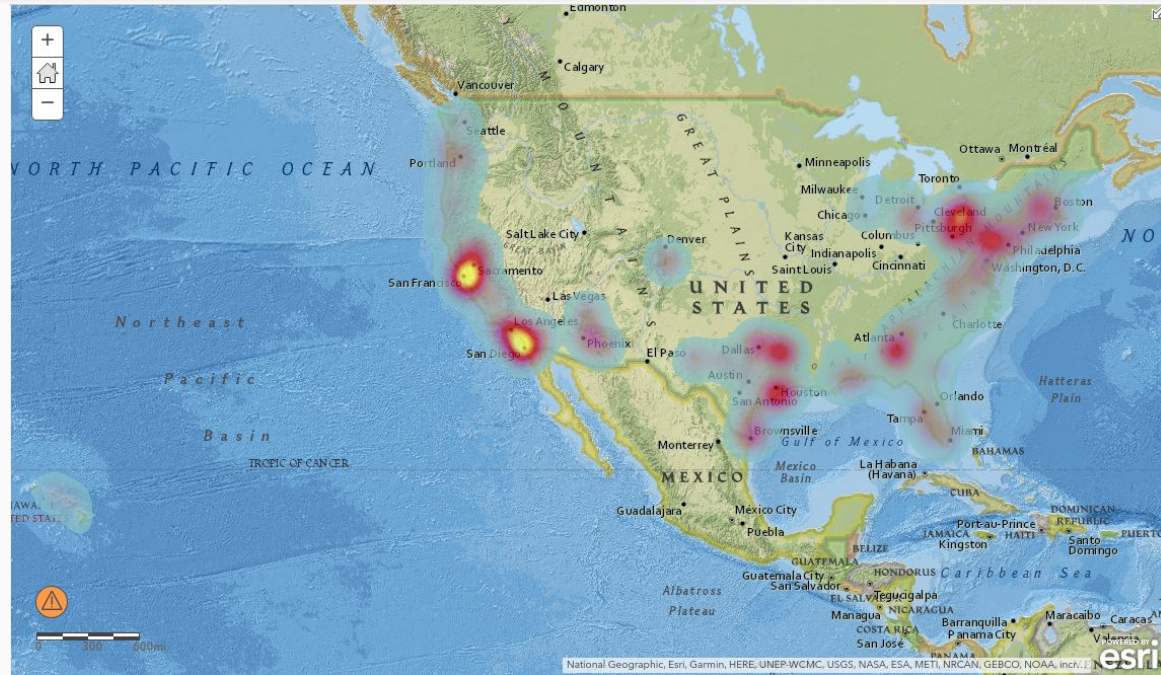
- Dataset is input by any person who has the app, so there is a greater chance for error
- Went through and eliminated all outlier data, such as a single person picking up a single piece of trash weighing 10,000 pounds
- Gathered 2019 U.S. population estimates from the U.S. Census Bureau

<http://arcg.is/0zOzWC>

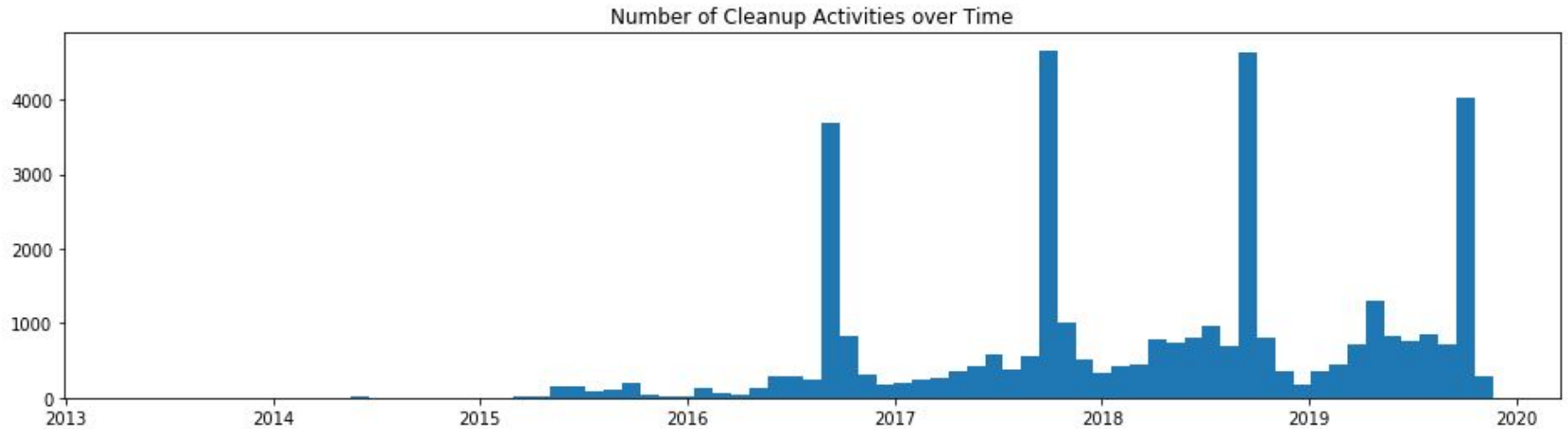
# Locations of Trash Cleanups



# Concentration of Trash by Pounds Collected



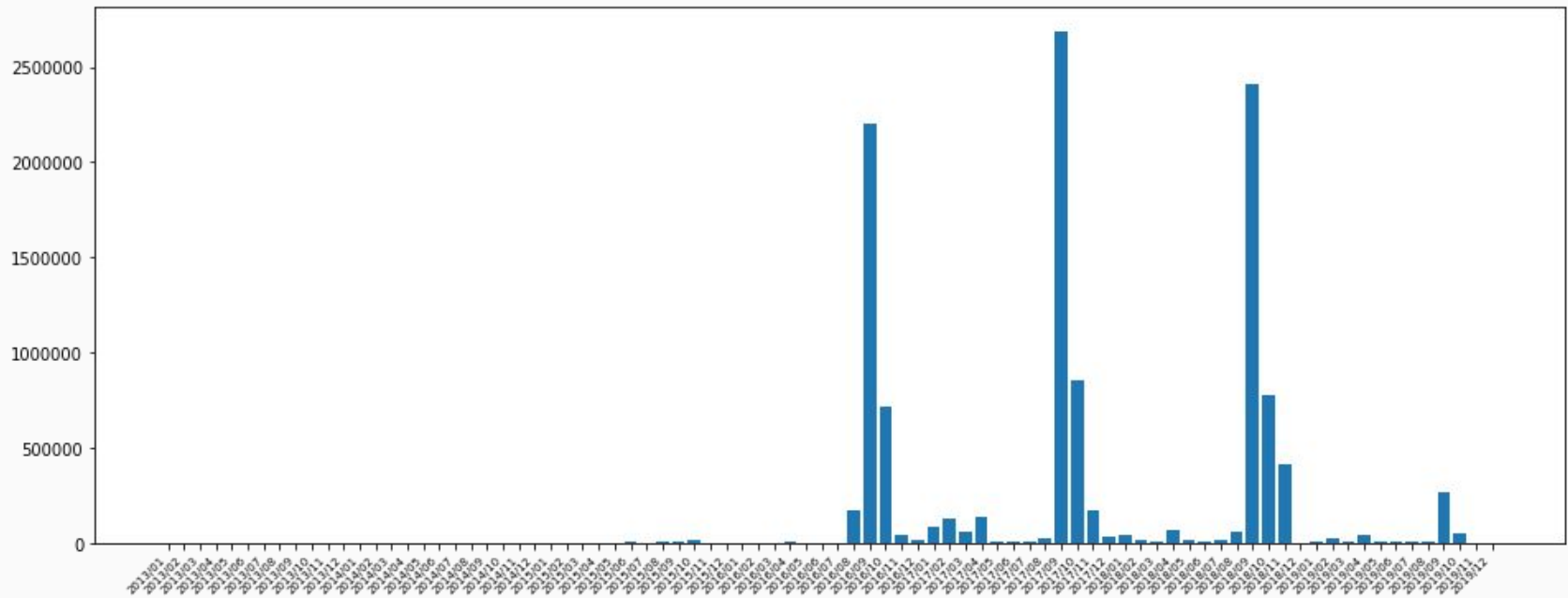
# Number of Events by Month





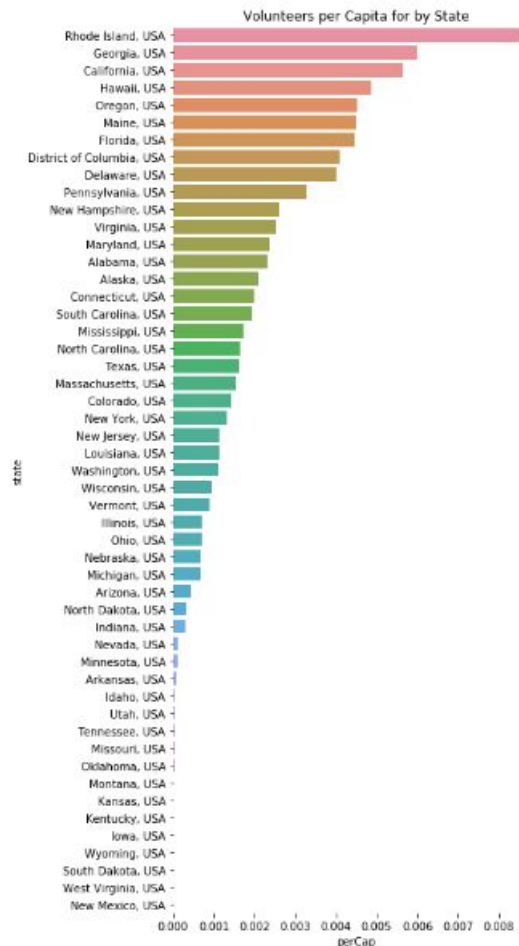
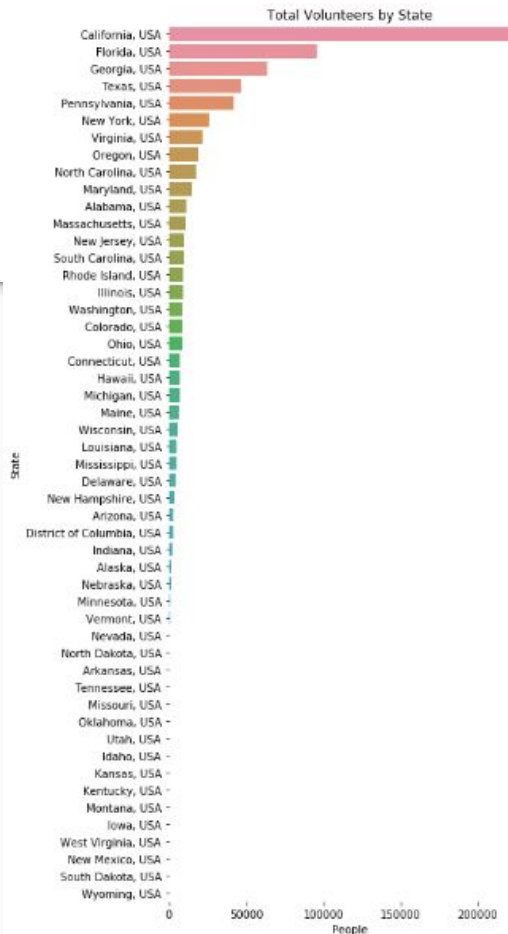
# Pounds Per Month

Cleanup Pounds by Months from 2013-2019



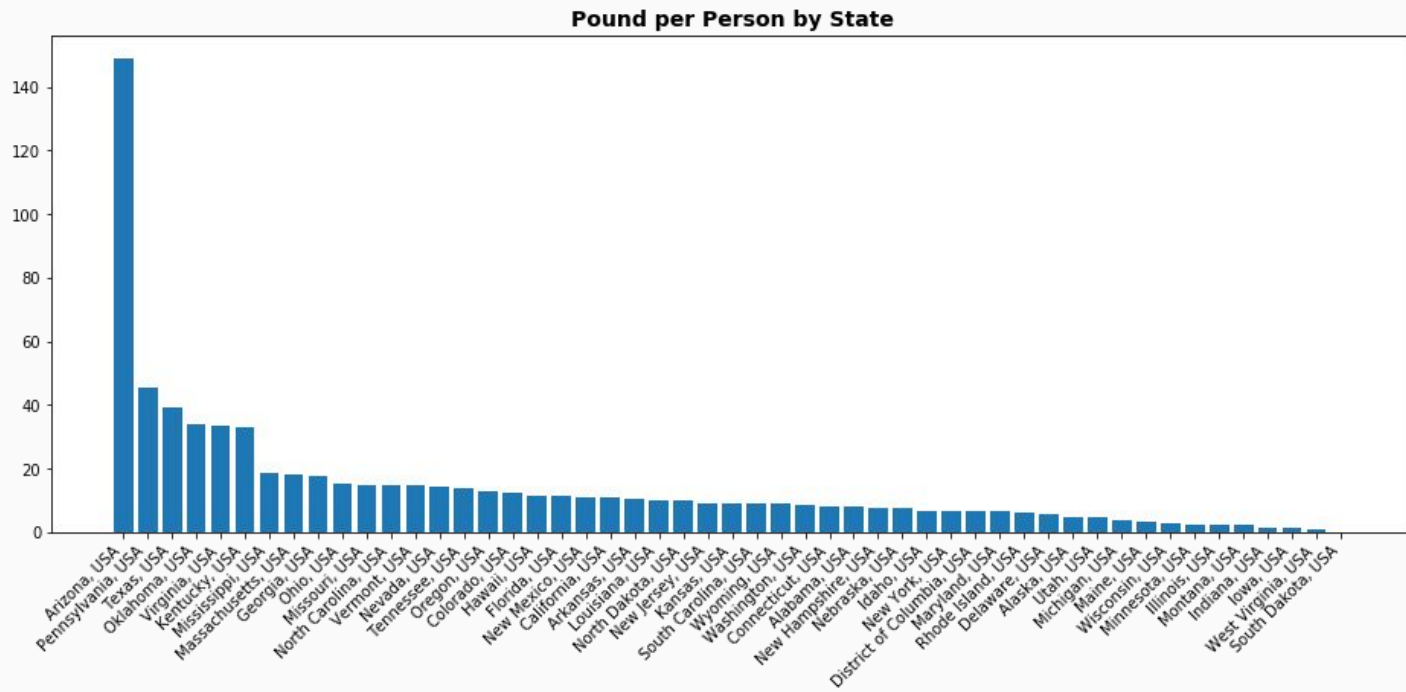
# Volunteers by State

State Population taken from  
2019 Population Estimates  
by U.S. Census Bureau



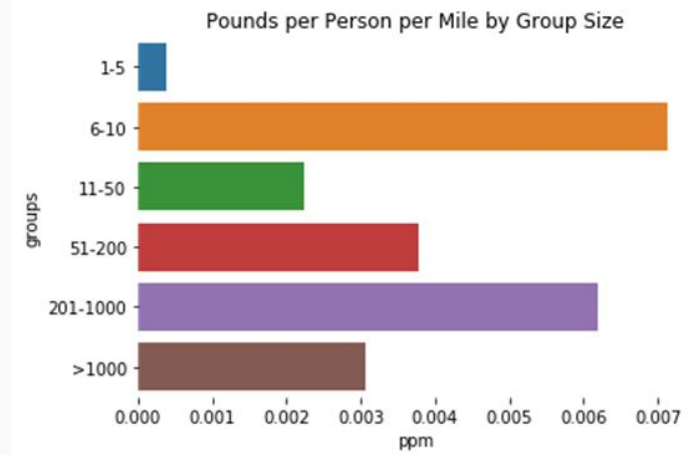
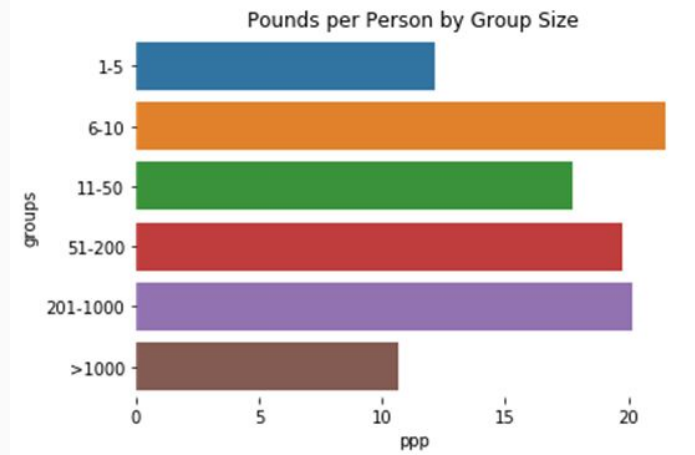


# Pounds Per Person for Each State



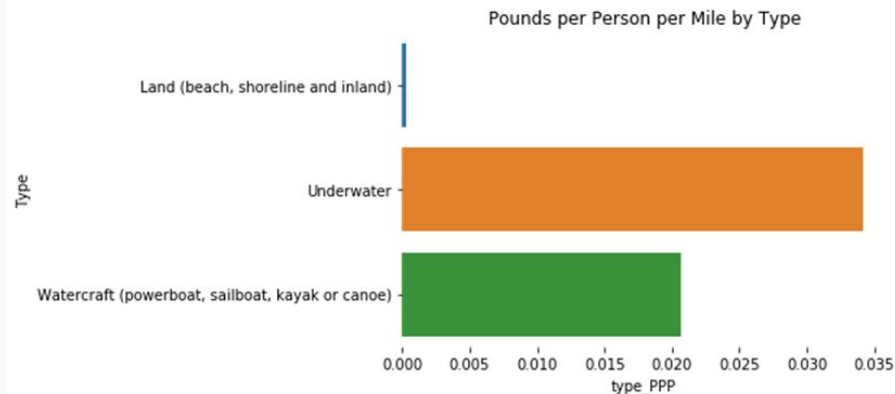
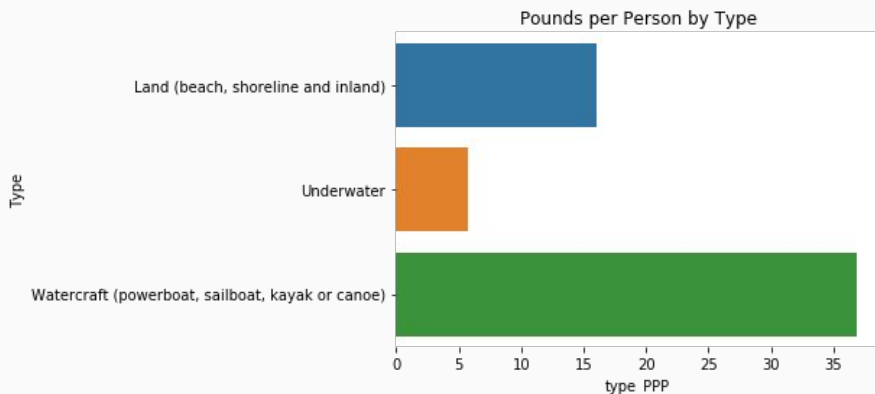
# Effective Group Sizes/Cleanup Types

Effectiveness measured by pound per person and pound per person per mile



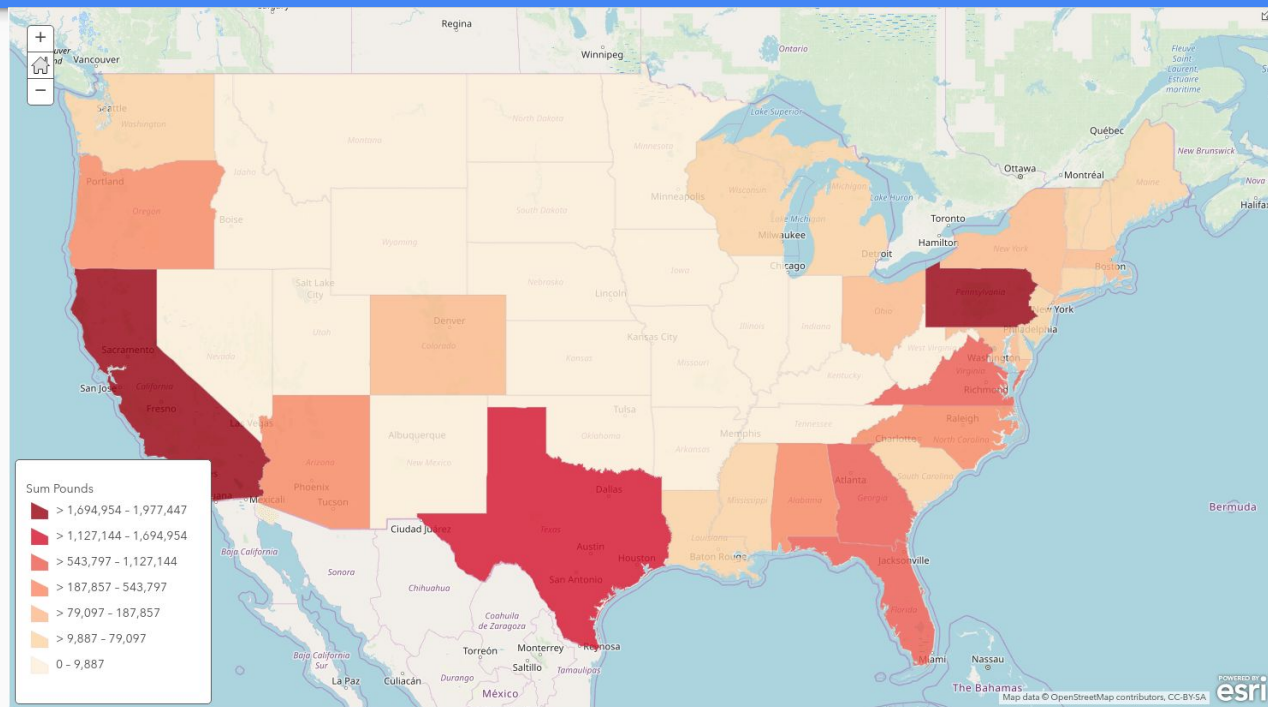
# Effective Group Sizes/Cleanup Types

Effectiveness measured by pound per person and pound per person per mile

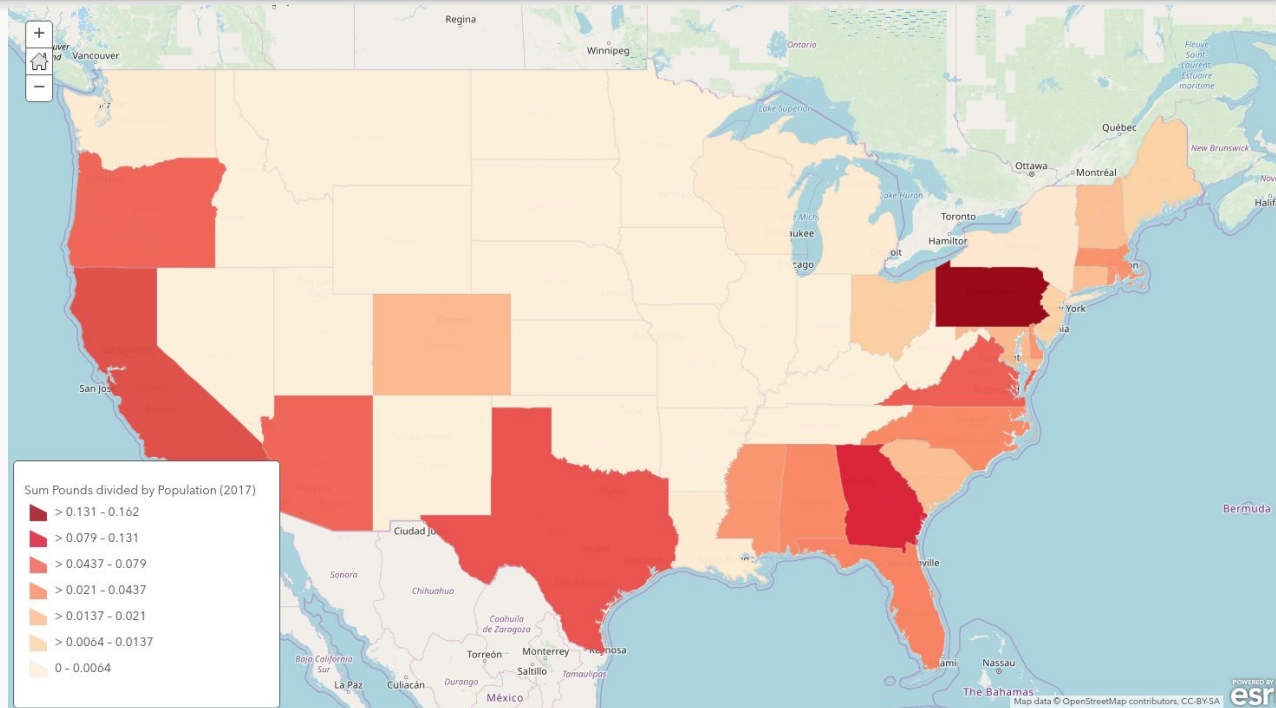


<http://arcg.is/19GqXC>

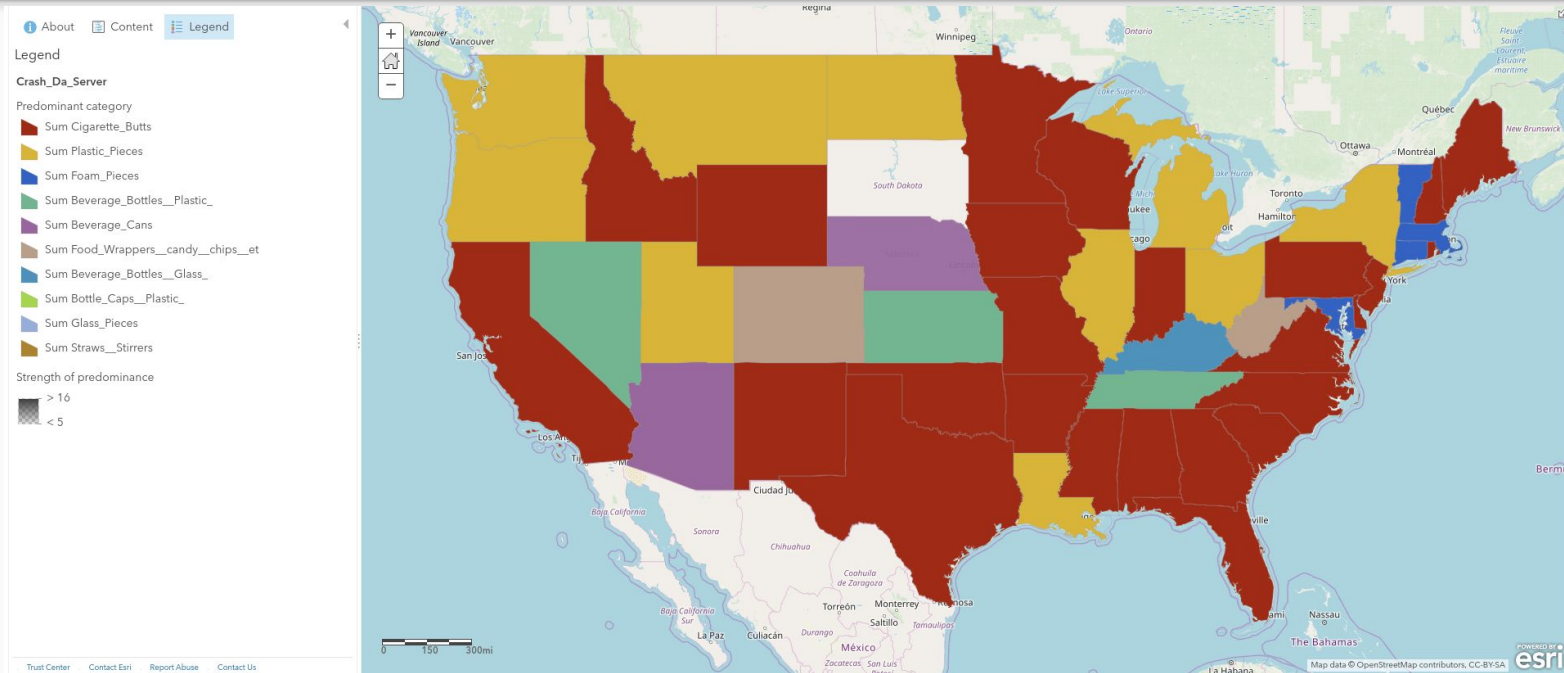
# Volume of Garbage Collected by State



# Garbage Volume Collected Per Capita



# Most Common Trash Item for each State



# Related Items (K-nearest Neighbors)

## Cigarette Butts:

Food Wrappers (candy,  
chips, etc.)  
Bottle Caps (Plastic)  
Beverage Bottles (Plastic)  
Glass Pieces  
Straws, Stirrers  
Bottle Caps (Metal)  
Beverage Bottles (Glass)

## Take Out/Away Containers (Foam):

Cups, Plates (Foam)  
Cups, Plates (Plastic)  
Cups, Plates (Paper)  
Tobacco Packaging/Wrap  
Paper Bags  
Construction Materials  
Forks, Knives, Spoons

## Fishing Net & Pieces:

Fishing Buoys, Pots &  
Traps  
Cigarette Lighters  
Condoms  
Appliances  
(refrigerators,  
washers, etc.)  
Syringes  
Diapers  
Personal Hygiene  
(Clean Swell)

## Tampons/Tampon Applicators:

Syringes  
Condoms  
Appliances  
(refrigerators, washers,  
etc.)  
Cigarette Lighters  
Diapers  
Personal Hygiene  
(Clean Swell)  
Toys



# Sustainability

- The success and improvement of ocean and waterway cleanups depends on continued involvement of volunteers and outreach to communities
- Garbage pickup in waterways improves quality of life for wildlife and the serenity of the area, as well as improving water quality over time
- Outreach to communities near waterways, watersheds, and beach communities can improve the number of volunteers and the success of cleanup operations
- Volunteer operations prevent the need for major government intervention and can greatly improve health and use of major bodies of water

# Potential for Future Growth

- Coastal cities were major source of garbage cleanup
  - Areas such as the Allegheny River were major clusters of cleanup due to annual outreach and events, along with dedicated volunteers
- Interior waterways, especially major rivers and estuaries and rivers, represent an area of growth that is not utilized
  - Mississippi, Ohio, and Missouri river show few cleanup efforts, but represent a large volume of water flow into the Atlantic and Gulf of Mexico
  - Water flow can bring garbage to oceans and river deltas
- Locations for outreach focus can be major metropolitan areas in the Midwest, such as St. Louis, Chicago, Memphis

# Education/Outreach

- Outreach to children allows for better long-term involvement and influence in cleanups
- Maine, Rhode Island, Oregon, Hawaii, Delaware, Alaska and New Hampshire are the leading states in getting children involved in cleanups

