Mississippi River Plastic Pollution Initiative

MISSISSIPPI DELTA SCIENCE REPORT

GREENVILLE AND ROSEDALE, MISSISSIPPI

University of Georgia

Kathryn Youngblood, Sheridan Finder, Mayor Errick Simmons, Mayor Aelicia Thomas, Jeremiah Smith, Jenna Jambeck

Foreword

The Mississippi River is America's most essential inland waterway, providing hundreds of billions of gallons of water each day to key industries, as well as drinking water to 20 million people in 50 cities in 10 states. The river is rich in biodiversity, supporting the livelihoods of people living along the river as well as a wide range of plant and animal species.

But the river also hosts a threatening foreign substance — plastic pollution. Plastic litter that continuously enters the Mississippi River poses a large threat to environmental quality and ecosystem health, and these impacts extend far beyond the river valley. Up to 80% of marine plastic originates from land-based sources, and as the drainage system for 40% of the continental United States, this pollution travels through storm drains and smaller waterways into the river and its tributaries, ultimately making its way to the Gulf of Mexico and into the ocean.

Approximately 11 million metric tons of plastic enters the oceans each year, so understanding the extent of the plastic pollution problem is key to devising effective solutions. The United Nations Environment Programme's North America Office, the Mississippi River Cities and Towns Initiative and University of Georgia's Debris Tracker have come together through the Mississippi River Plastic Pollution Initiative to generate a first ever snapshot of plastic pollution along the River.

Using a citizen science approach, this initiative facilitated and supported data collection at key sites along the river. The aim was to understand the movement and accumulation of plastic pollution while painting as rich a picture as possible within a small amount of time of the extent, type, and brand of plastic litter along the river. Following two successful phases in eight cities in 2021, the initiative expanded to the Mississippi Delta with a phase in Greenville and Rosedale, Mississippi.

The intention of this Mississippi Delta Science Report is to generate information about plastic waste concentrations in specific areas, which all stakeholders — from policy makers, to businesses and citizens — can use to take action within their communities. We hope that this research will not only help cities and towns in Mississippi, but also provide an example of what can be done collectively to address the plastic pollution crisis around the world.

Dr. Barbara Hendrie
Director, North America Office
United Nations Environment Programme

Colin Wellenkamp
Executive Director
Mississippi River Cities and Towns Initiative

Dr. Jenna Jambeck
Distinguished Professor, Environmental Engineering
University of Georgia

UN environment
United Nations Environment Programme

MRCTI

New Materials Institute
UNIVERSITY OF GEORGIA

Marine Debris Tracker

Published by:
Jambeck Research Group

Location:
The University of Georgia
Athens, GA, USA 30602
https://jambeck.engr.uga.edu/

Contact:
Dr. Jenna Jambeck
jjambeck@uga.edu

Authors:
Kathryn Youngblood, Sheridan Finder, Mayor Errick Simmons, Mayor Aelicia Thomas, Jeremiah Smith, and Jenna Jambeck

Recommended Citation:
Youngblood, K., et al. 2022. Mississippi River Plastic Pollution Initiative, Mississippi Delta Science Report, Jambeck Research Group, University of Georgia, Athens, GA, USA.

Design/Layout:
Deeds Creative, Athens GA

Photo Credits:
Cover: Unsplash

Special Thanks:
To Brianna Bettis, Alana Mason, Elyssia Jones, and the Rosedale Freedom Project

URL Links:
This publication contains links to external websites. Responsibility for the content of the listed external sites always lies with their respective publishers.

Maps:
The maps printed here are intended only for information purposes and in no way constitute recognition under international law of boundaries and territories. The Jambeck Research Group accepts no responsibility for these maps being entirely up to date, correct, or complete. All liability for any damage, direct or indirect, resulting from their use is excluded.

On behalf of:
The Mississippi River Plastic Pollution Initiative

Disclaimer:
The views expressed in this report do not necessarily represent the opinions, decisions, or the stated policies of the United Nations Environment Programme, The Mississippi River Cities and Towns Initiative, or of any of the other project partners.

UN environment programme

MRCTI

New Materials Institute
UNIVERSITY OF GEORGIA

Marine Debris Tracker

Contents

Figures & Tables

Executive Summary

The United Nations Environment Programme (UNEP) North America Office, the Mississippi River Cities and Towns Initiative (MRCTI), the University of Georgia's Debris Tracker, and other local and national partners are working together as part of the Mississippi River Plastic Pollution Initiative to generate a first-ever snapshot of the state of plastic pollution along the Mississippi River.

Community members and partners surveyed targeted areas in Greenville and Rosedale, Mississippi, to understand the movement and accumulation of plastic pollution. Community members and partners collected data with Debris Tracker, an open data citizen science movement and free mobile phone app.

The data gathered in the Mississippi Delta was examined to understand the state of plastic litter, generating as rich a picture as possible, within a dedicated timeframe, of the extent and type of litter that can make its way to the river.

This project consisted of scientific strategy development and refinement, volunteer training and outreach, field data collection, and data analysis and reporting. The community training and data collection occurred from June – July, 2022. The initiative was successful with 6,400 total litter items logged in Greenville and Rosedale from June 11 - July 17, 2022. Plastic was the top material found, comprising 57% of the items logged in the Mississippi Delta. When looking at the aggregate of data from both Rosedale and Greenville, the top items were: paper and cardboard, beverage bottles, food wrappers, hard plastic fragment, aluminum or tin cans, foam or plastic cups, plastic bags, glass bottles, and paper food wrappers. Personal Protective Equipment (PPE), an emerging contaminant in the environment and waterways, was a consistent 1% of the items found (by count).

Both Rosedale and Greenville were successful in collecting adequate data to provide a baseline snapshot of the litter in each city. The average litter density (calculated by the number of litter items over the area surveyed in count/m2) was 0.37 items/m2 in Greenville and 1.83 items/m2 in Rosedale. To visualize this density, imagine that when observing a 1-m (3-ft) wide path while walking along a 100 m city block, one would see 37 or 183 litter items, respectively. The litter density was on the lower end of other densities observed along the river in Greenville and on the highest in Rosedale when compared to densities in other communities surveyed along the river. Brand information was logged for 38 litter items, identifying 27 unique brand names. These brand names were then associated with their parent companies, with 17 parent companies identified in the litter. Essential to the success of this project is the participation of communities, especially the leadership and engagement of the Mayors and Mayors' offices. Results from the Mississippi Delta initiative were presented to local partners and mayors, August 29 and 31, 2022. Based upon the project core partners and discussions with the cities and local partners, the following opportunities for reducing plastic pollution in the Mississippi River Delta have been identified:

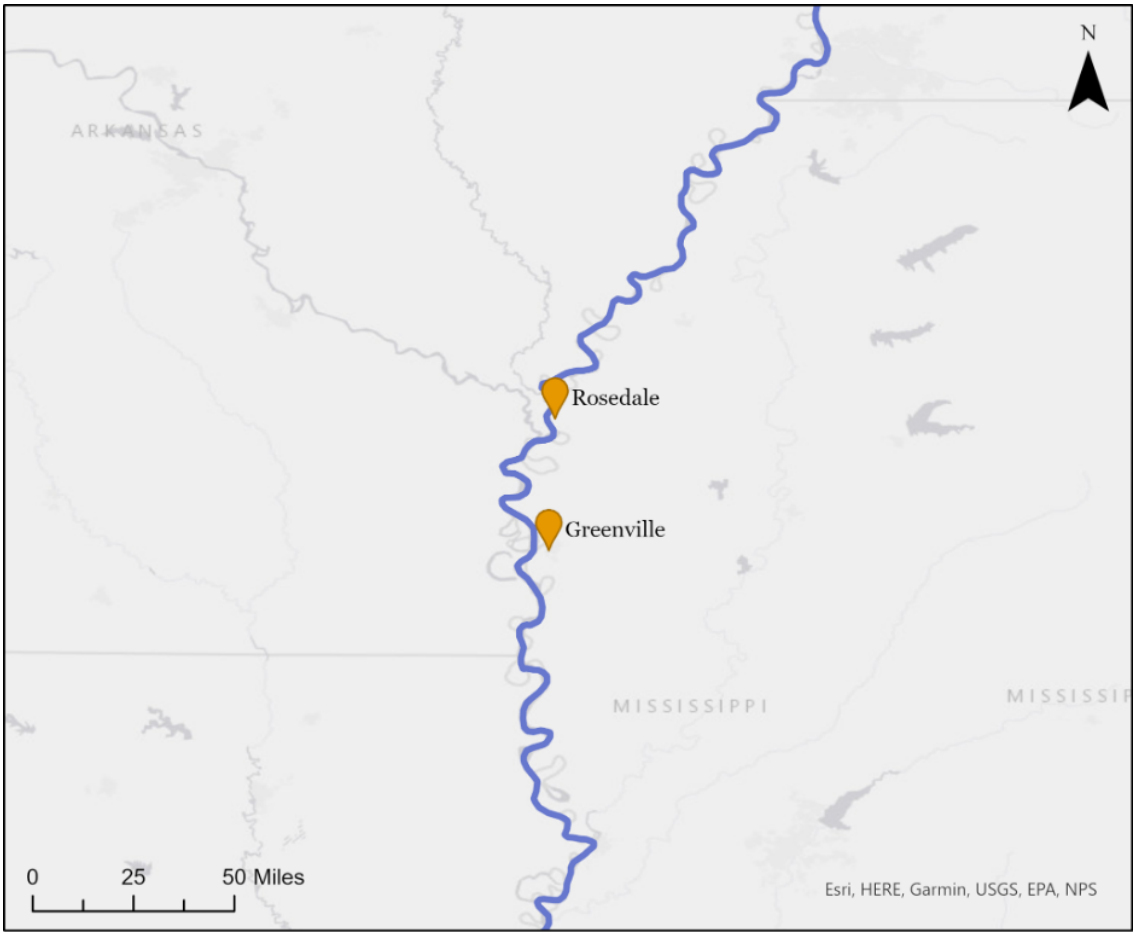
- Greenville previously had a robust cardboard and paper drop-off recycling program, but the program was discontinued due to price increases. Offering cardboard and paper recycling in Greenville may be of particular utility given the high levels of paper and cardboard found in the litter in Greenville.
- Greenville has a city-managed trash collection program with their own vehicle fleet that provides reliable service to residents. Residents have an action hotline they can call to report issues such as litter or illegal dumping. Greenville has demonstrated its capacity to build out successful, accountable waste management systems which could be leveraged into additional infrastructure development.
- Plastic and aluminum recycling bins are available at big box stores throughout Greenville. Greenville's litter had a higher fraction of recyclable items, like aluminum or tin cans and plastic beverage bottles, which may suggest opportunities for targeted interventions.
- Greenville has previously received funding to provide recycling education in schools. This work could be built upon to prevent recyclables entering the environment.
- Existing community partnerships and beautification efforts in Greenville could be expanded to further reduce litter.
- Rosedale contracts out trash pick up to a private company within the same country but it's not local. While this is more economically efficient for the city, there are challenges with inconsistencies of trash pick up and lack of local accountability and ownership by the contractor. These challenges with a private contractor may contribute to higher litter densities in Rosedale.
- Rosedale does not have access to any local recycling drop off locations. The nearest recycling drop-off is in Cleveland, MS about 20 miles away.
- High litter densities in concentrated areas in Rosedale exhibit a need for more and improved maintenance of receptacles to manage waste.
- The high litter densities in Rosedale highlight a need to further explore and for more resources to go to rural and impoverished communities in the US.
- Much of the litter was single-use plastic products, which could potentially be avoided through various alternatives. The question was posed, if there are external impacts to plastic use, is it really as convenient as we see it in our lives? This perspective may motivate initiating, expanding and improving reuse systems and making reuse more of a default behavior.
- Many options for alternatives to plastic already exist, such as paper, beeswax, and other natural materials. Renewable and reusable alternatives need to be affordable and accessible to everyone, especially those in low-income and underserved communities where affordability is an issue.
- Expanded and enhanced local food systems could reduce the need for plastic packaging in some use cases.
- Stormwater catchment devices could help to trap unpreventable litter before it enters waterways.
- Connecting with common brands of litter items could give companies an opportunity to invest in marginalized communities in rural America.

Results

Background

Data collection in the Mississippi River Delta was the third set of cities to participate in the Mississippi River Plastic Pollution Initiative (MRPPI). In total, 6,400 litter items in 88 unique surveys were logged in both Rosedale and Greenville, Mississippi in the Mississippi Delta from June 11 - July 14, 2022. Rosedale and Greenville's location in relation to the Mississippi River are shown below in Figure 1.

Figure 1: Rosedale and Greenville, MS locations



The majority of items found in the Mississippi Delta were plastic (57%), although paper and lumber were also a significant fraction at 20% (Figure 2). Other cities surveyed along the Mississippi River had higher fractions of plastics, typically between 74% and 82%. Metal comprised 20% of items found, followed by glass at 6%. Consistent with findings in other cities along the Mississippi River, PPE comprised 1% of litter found. The overall top items were paper and cardboard (e.g., pieces of paper, receipts, paperboard, etc.), followed by beverage bottles, food wrappers, hard plastic fragments, and aluminum or tin cans (Figure 3). Single-use plastic items, like bottles, wrapper, cups, and bags, were prevalent in the top 10 litter items, as were highly recyclable products like plastic PET beverage bottles and aluminum cans.

Figure 2: Material categories of litter items (percent of abundance) logged in the Mississippi Delta

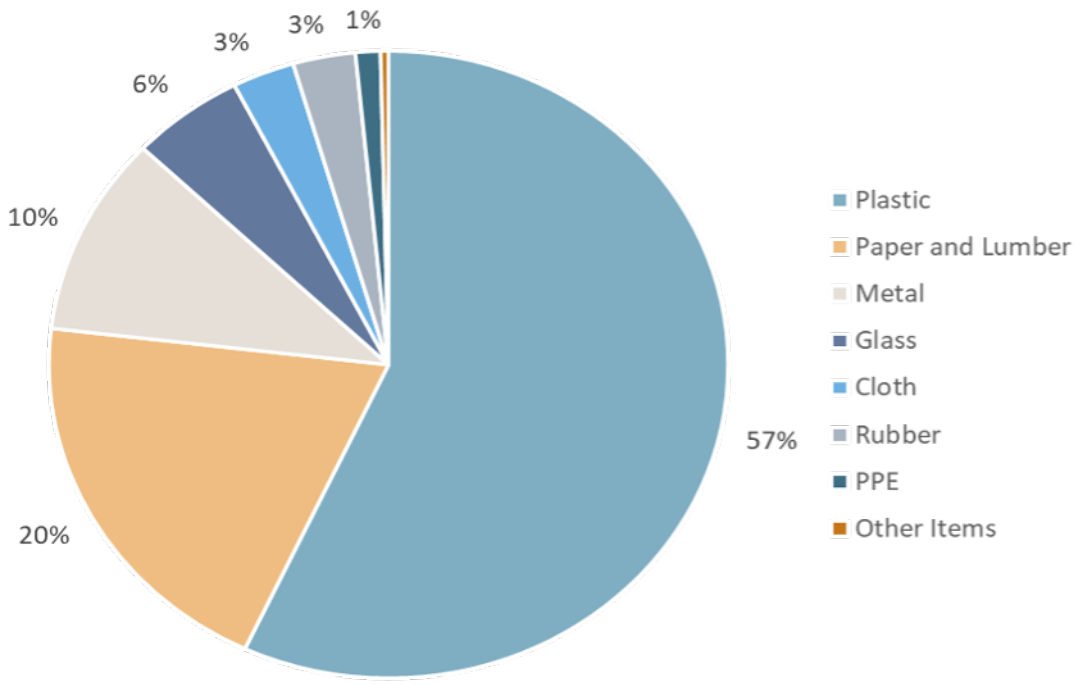
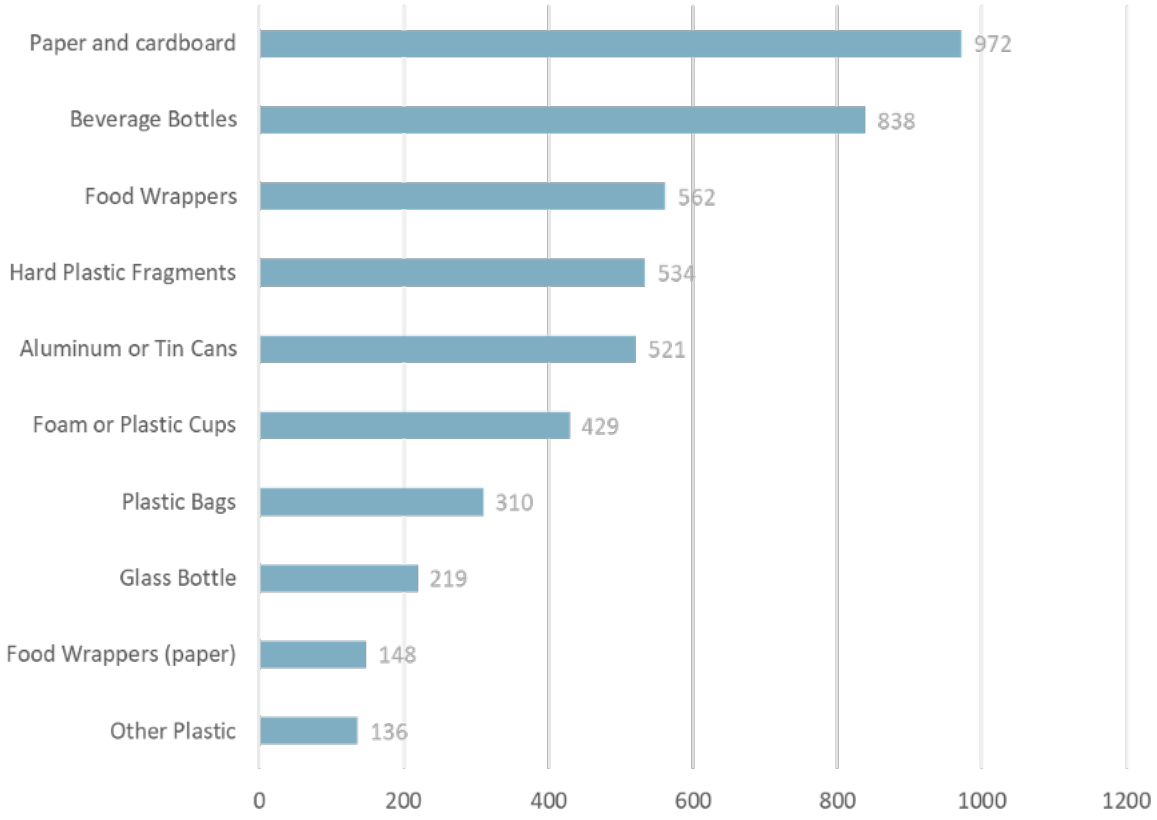


Figure 3: Top litter items (by count) logged in communities surveyed in the Mississippi River Delta



Litter Densities

In each city, data was collected by project partners along transects that were 1 m in width following roadways and walkways. After data was submitted, the researchers used GIS to measure the length of each transect with ArcMap and isolated litter logged in that location to obtain a litter density. Litter densities in Greenville ranged from 0.02 items/m2 to 1.47 items/m2 and averaged 0.37 items/m2. Litter densities in Rosedale ranged from 0.49 items/m2 to 15.21 items/m2 and averaged 1.83 items/m2. The litter density in Greenville was lower than most cities (outside of St. Paul) that have been surveyed, while the litter density in Rosedale was the highest when compared to density in other communities surveyed along the river for the MRPPI (Table 1). Further discussion of the data from each community is provided in each city section.

Table 1: Average litter densities across communities surveyed along the Mississippi River for the MRPPI

Community	Primary Survery Date(s)	Average Litter Density (items/m²)
Baton Rouge, Louisiana	March - April 2021	0.61
St. Louis, Missouri	March - April 2021	0.69
St Paul, Minnesota	March - April 2021	0.28
Davenport, Iowa	October 2021	0.50
Bettendorf, Iowa	October 2021	0.20
Rock Island, Illinois	October 2021	0.73
Moline, Illinois	October 2021	0.71
East Moline, Illinois	October 2021	0.61
Greenville, Mississippi	June - July 2021	0.37
Rosedale, Mississippi	June - July 2021	1.83

Brand Data

During tracking litter, participants were asked to record the brand names of items where visible. In total, 38 unique litter items tagged with 27 brand names, The brand names recorded for various item types are listed below in Table 2

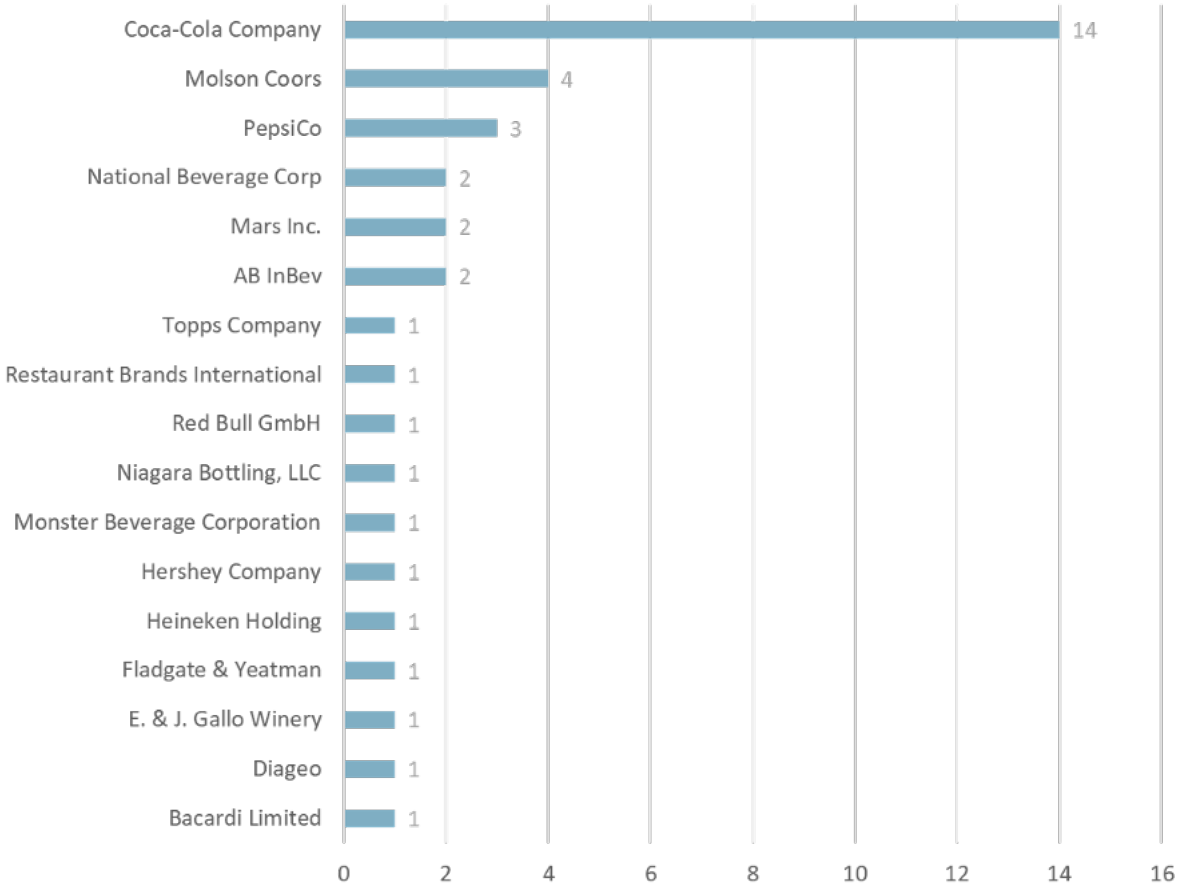
Table 2: Brand names recorded in the litter by item type; brands are sorted by alphabetical order

Item	Brand Names
Aluminum or Tin Cans	Bud Light, Coca Cola, Coors, Crown Royal, Michelob Ultra, Red Bull, Rip It, Sprite, Steel Reserve
Beverage Bottles	Brisk, Clear Fruit, Coca Cola, Dasani, Minute Maid, Niagara, Pepsi, Smartwater, Sprite
Foam or Plastic Cups	Popeyes
Food Wrappers	Hersheys, Orbit, Ring Pop, Ruffles, Snickers
Glass Bottle	Bacardi, Corona, Heineken, Taylor Port, New Amsterdam

Through desktop research, brand names were traced back to their associated parent companies. The Coca-Cola Company, Molson Coors, and PepsiCo were the most frequent parent companies in the dataset (Figure 4). The

Coca-Cola Company's products found in the litter were both aluminum cans and plastic bottles. Molson Coors produced aluminum cans. PepsiCo produced both plastic bottles and plastic food wrappers.

Figure 4: Parent companies of brands found in litter in the Mississippi Delta



Land Use

For this project in Debris Tracker, the completion of tracking litter items prompts a survey about the land use of the surrounding area (hyperlocal land use). Of the 88 surveys completed, 64 reported the land use of the area where data was collected. Of the 6,400 litter items logged, 876 litter items were tagged with a land use. Options for land use included residential (housing), commercial (developed buildings), mixed (housing and buildings), industrial (such as warehouses), green space (such as parks), and other. Users could select multiple options for land use. By proportion, mixed use areas were 34% of the surveys conducted but 69% of the litter collected was in mixed use areas, meaning it was a particularly littered land use type (Figures 5 and 6). Commercial-only areas had relatively less litter, representing 19% of the surveys but only 3% of the litter. Residential-only areas followed a similar pattern, representing 19% of the surveys but only 2% of the litter items. Greenspaces had about the same proportion of surveys and litter items (26% and 21%, respectively) as did Green Spaces-Commercial mixed areas (2% and 5%, respectively). One

possibility for mixed use land being littered is a lack of specific use and ownership. Residents and groups of commercial stores in smaller towns may work together to keep their area clean, but without that sense of ownership, litter may accumulate.

Figure 5: Proportion of surveys conducted in each land use type in the Mississippi River Delta

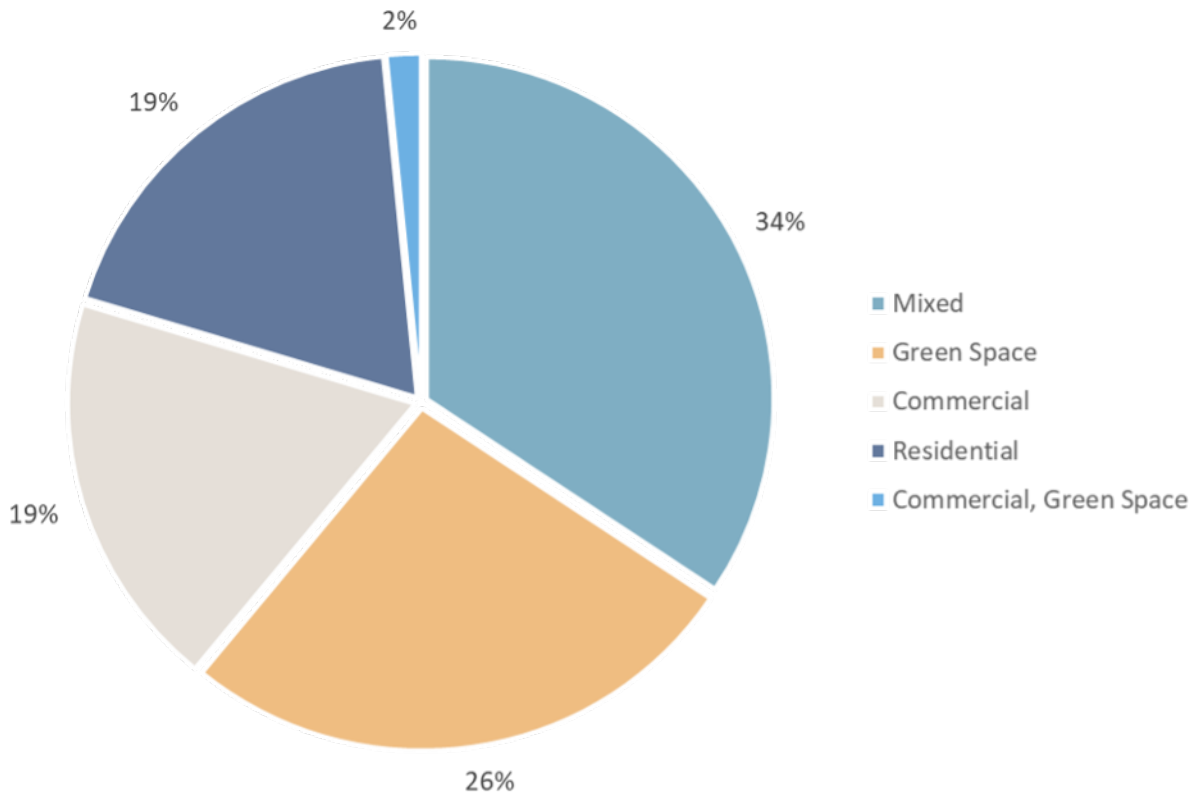
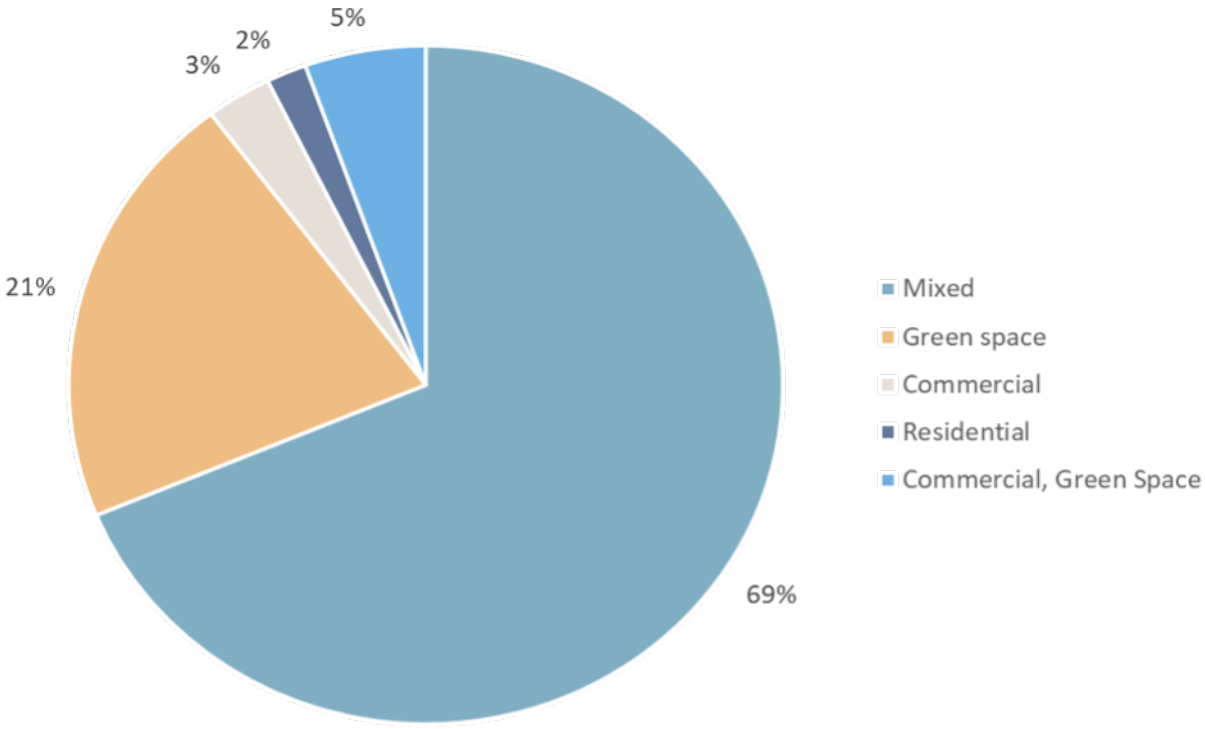


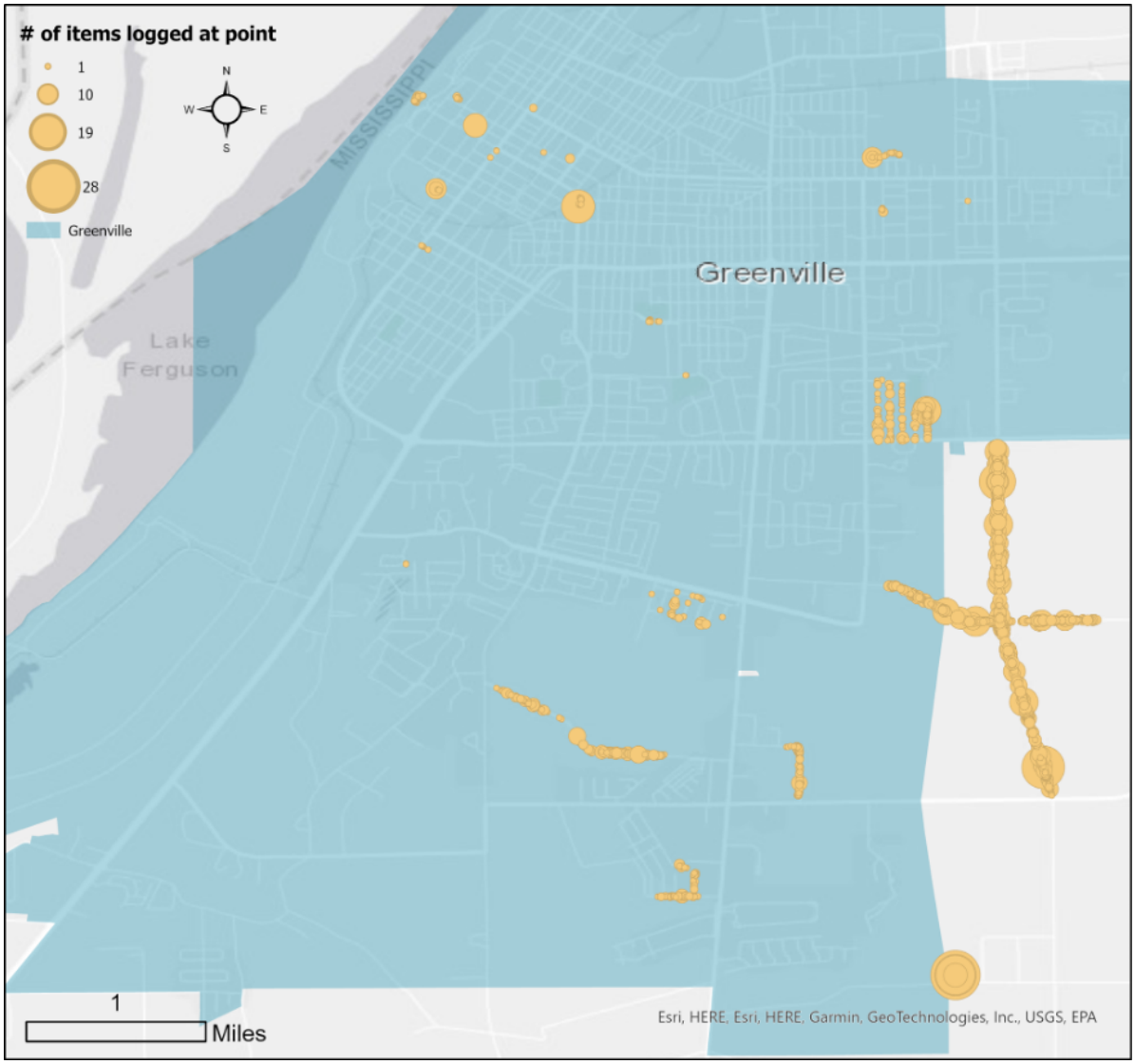
Figure 6: **Proportion of litter items logged in each land use type in the Mississippi River Delta**



Litter in Greenville

The population of Rosedale, MS is just under 30,000 people (approx. 29,854 in 2020). It is one of the smaller stand-alone cities participating in the MRPPI, but near the size of some of the Quad Cities, like East Moline, IL. In total, 5,084 items logged in Greenville during the data collection. Geographically, the data included transects dispersed throughout the city center as well as on less commercial roads outside of town (Figure 7).

Figure 7: Geographic distribution of data collection in Greenville, MS



Plastic was the most common material type of the litter items logged in Greenville, comprising 52% of the litter (Figure 8). Paper and lumber were next, comprising 23% of the litter, followed by metal at 11%. While plastic is still the majority in Greenville, it is lower than other cities along the River, where plastic is typically 74% to 82% of the litter logged. This trend is also reflected in the top items, as paper and cardboard (e.g., pieces of paper, receipts, paperboard, etc.) were the most common item logged (Figure 9). Other common items included beverage bottles, food wrappers, aluminum or tin cans, and foam or plastic cups. Missing from the top ten are cigarette butts, which have been common in other cities along the Mississippi River. Many of the top litter items, such as plastic bags and container caps, are single-use plastic packaging. Aluminum cans and plastic beverage bottles, both in the top 10 items, are recyclable at recycling drop off points located at big box stores within the community.

Figure 8: Material categories of litter (percent of abundance) logged in Greenville, MS

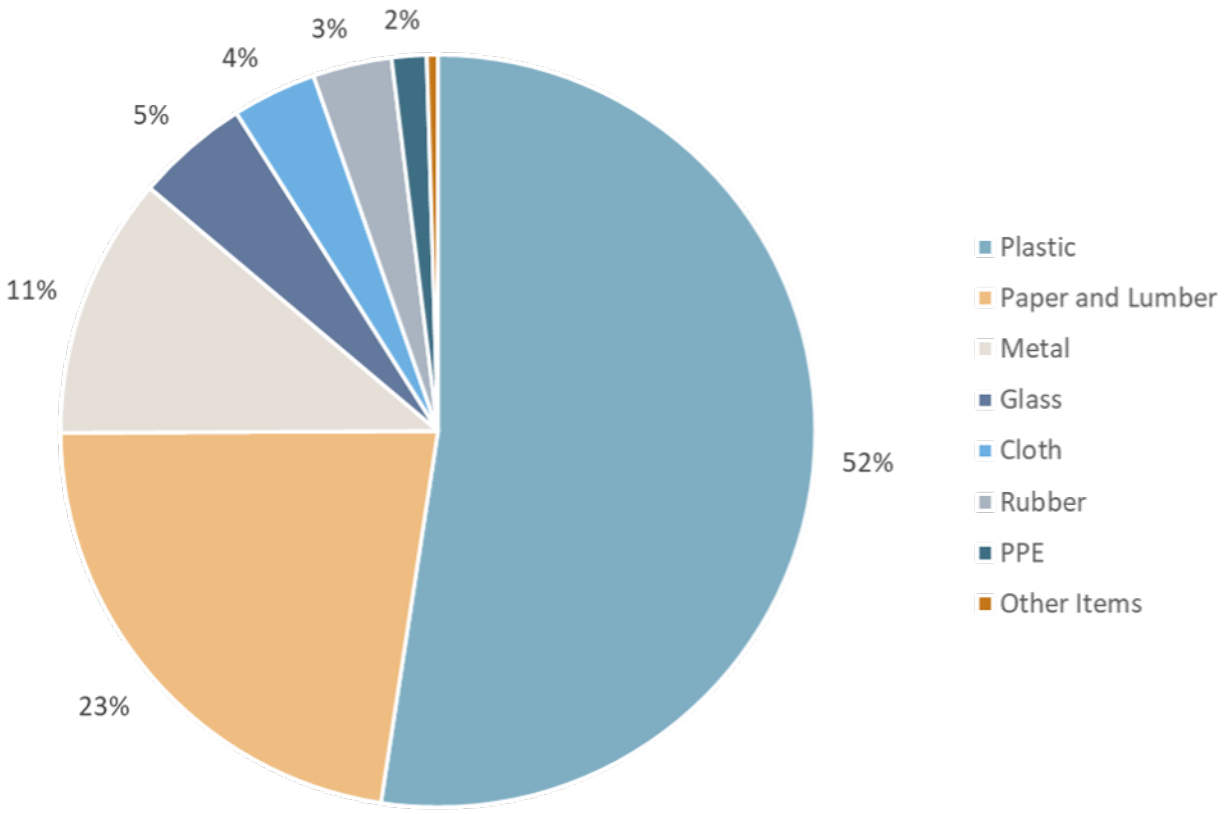
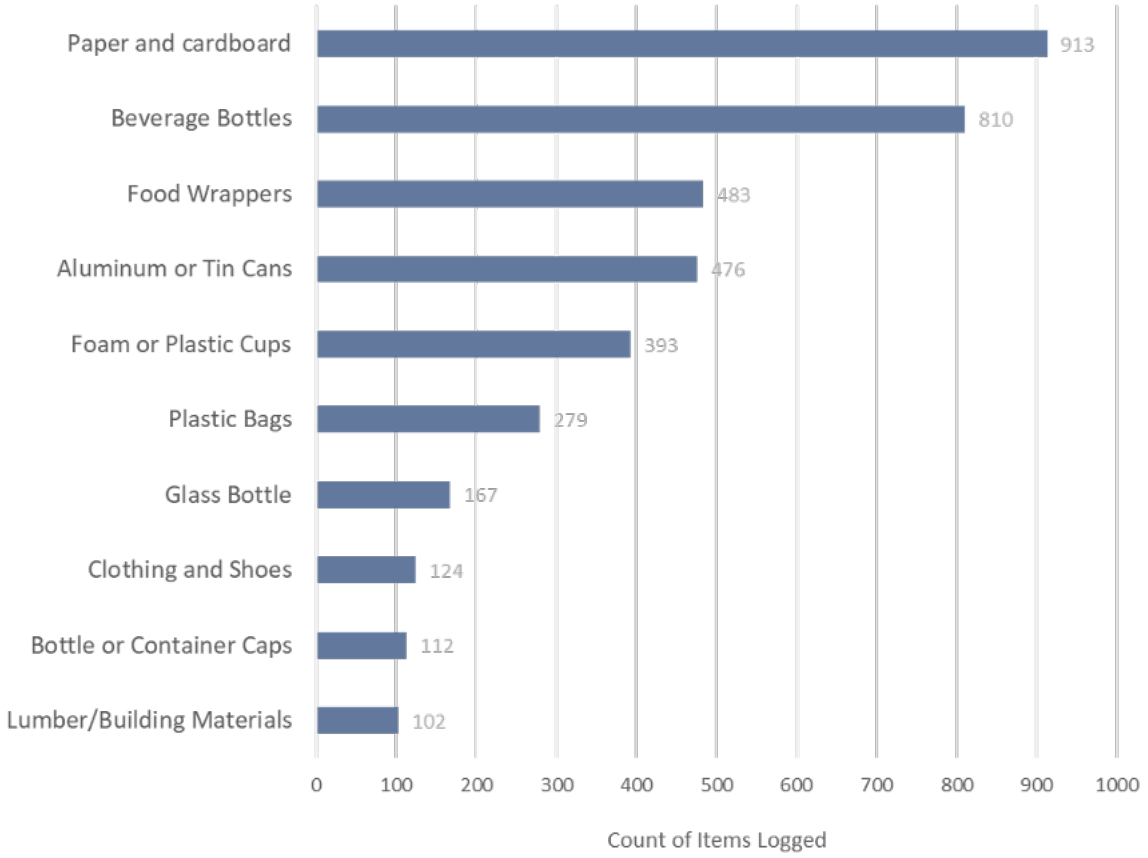
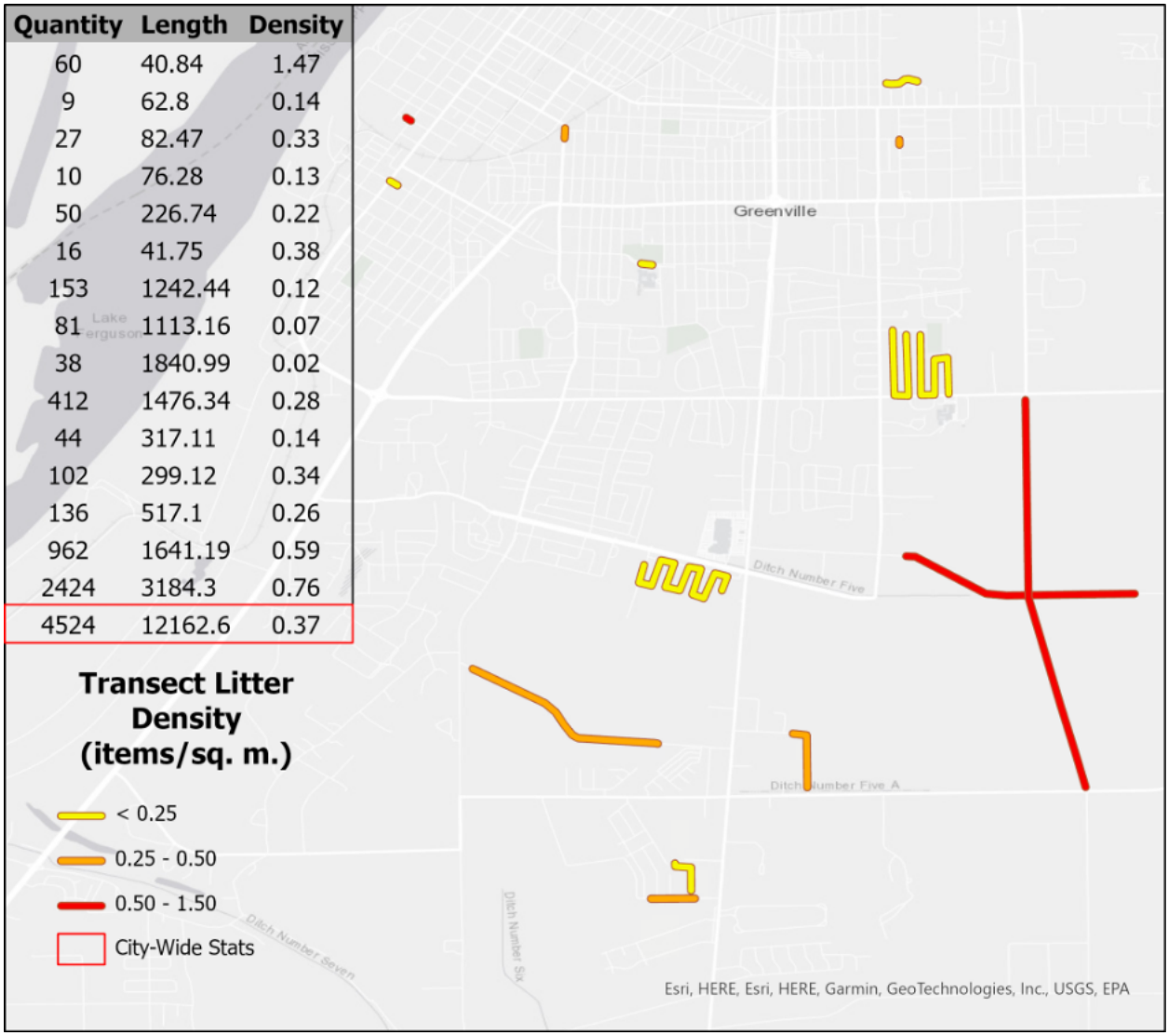


Figure 9: Most common litter items (by count) logged in Greenville, MS



Litter densities in Greenville ranged from 0.02 items/m2 to 1.47 items/m2 and averaged 0.37 items/m2 (Figure 10). Average litter densities in other communities surveyed along the Mississippi River have ranged from 0.28 to 0.69 (excluding Rosedale, MS, which was a part of this work).

Figure 10: Litter densities in Greenville, MS

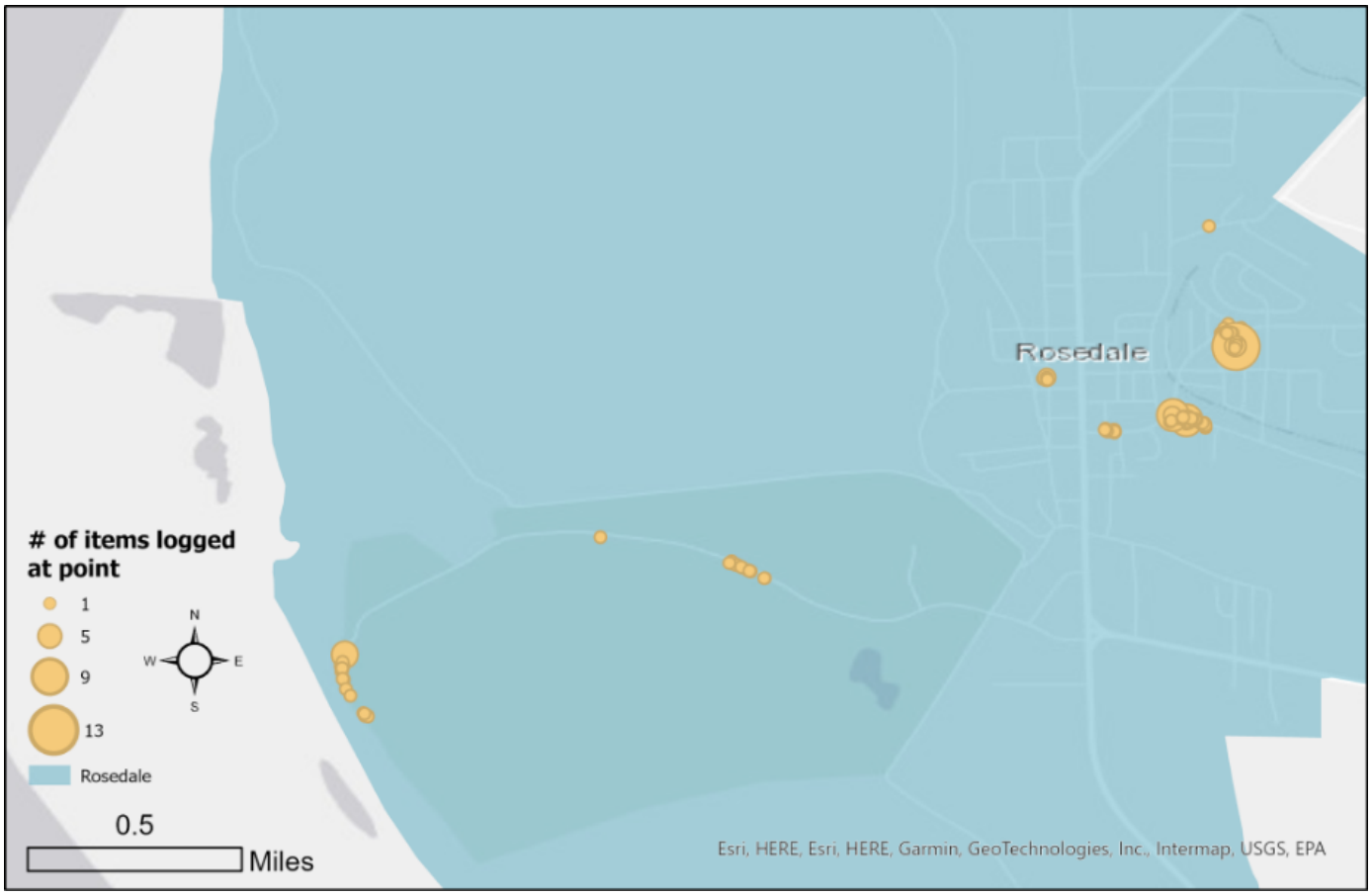


As seen on the map above, the highest litter densities were not in the central areas of the community but further on the edge of town. According to insights from local partners, these higher densities are along highly trafficked roads.

Litter in Rosedale

The population of Rosedale, MS is less than 2000 people (approx. 1855 in 2020). It is by far the smallest city in the MRPPI to collect data. Most data was collected by project partner, the Rosedale Freedom Project, who had funding for this work, as well as to create a film about this issue in their community. In total, 1,316 items were logged in Rosedale during the data collection. Geographically, the data included transects dispersed in the center of the community as well as data collected in the park to the southwest of the city (Figure 11).

Figure 11: Geographic distribution of data collection in Rosedale, MS



Plastic was the most common material type in Rosedale, comprising 75% of the litter items logged in the community (Figure 12). This fraction is higher than that found in Greenville (52%) and is more consistent with other communities surveyed along the Mississippi River corridor, which typically have 74% to 82% plastic. Paper and lumber were next,

comprising 10% of the litter, followed by metal at 7%. In terms of top items, hard plastic fragments were by far the most logged item in Rosedale (Figure 13). Based on in-field observations from local stakeholders, many of these were likely plastic beverage bottles or other larger items that had begun to fragment or had gotten shredded by mowing. One transect in particular had an abundance of plastic fragments. Other common litter items included single-serve plastic liquor bottles, food wrappers, paper and cardboard, and paper food wrappers. Single-serve plastic liquor bottles were ranked higher than we have seen in other communities. Local partners that participated in surveying litter noted that this might be due to survey locations near convenience stores and outdoor gathering spots. While tobacco packaging (often wrappers for tobacco products) was the sixth highest item observed, missing from the top ten are cigarette butts, which have been common in other cities along the Mississippi River. Aluminum cans are also in the top 10 litter items; cans are recyclable, but this service is not available locally in Rosedale.

Figure 12: Material categories of litter (percent of abundance) logged in Rosedale, MS

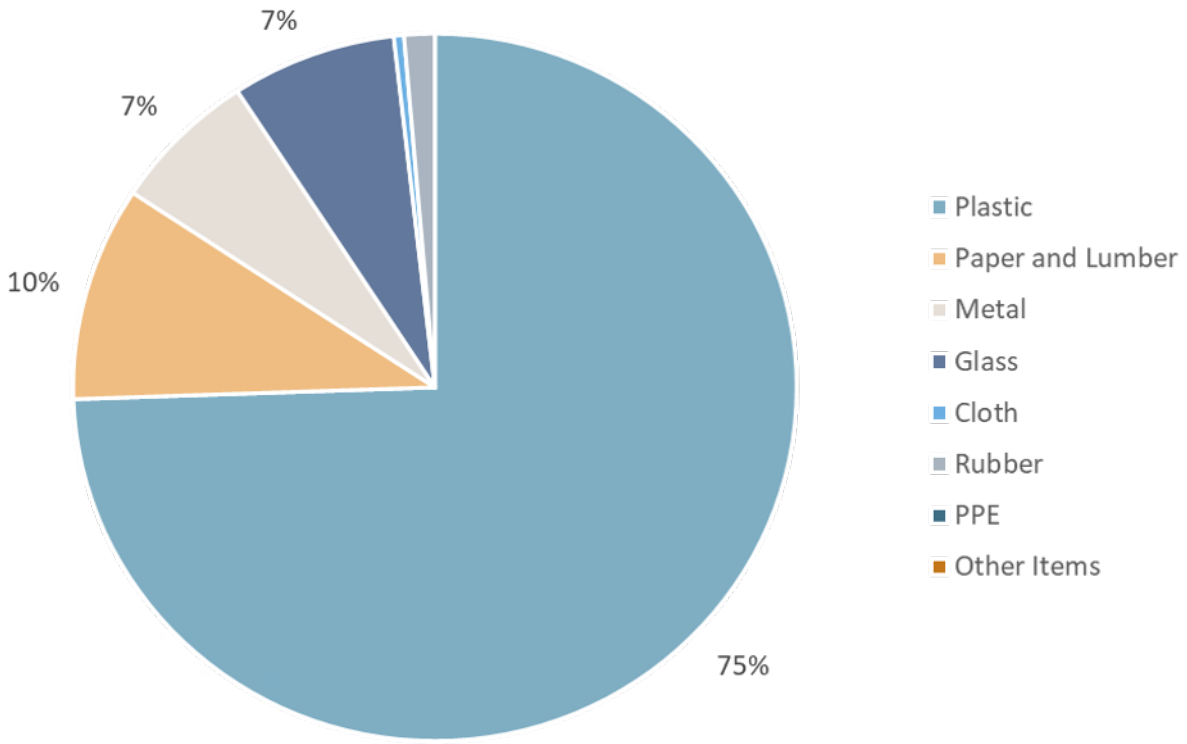
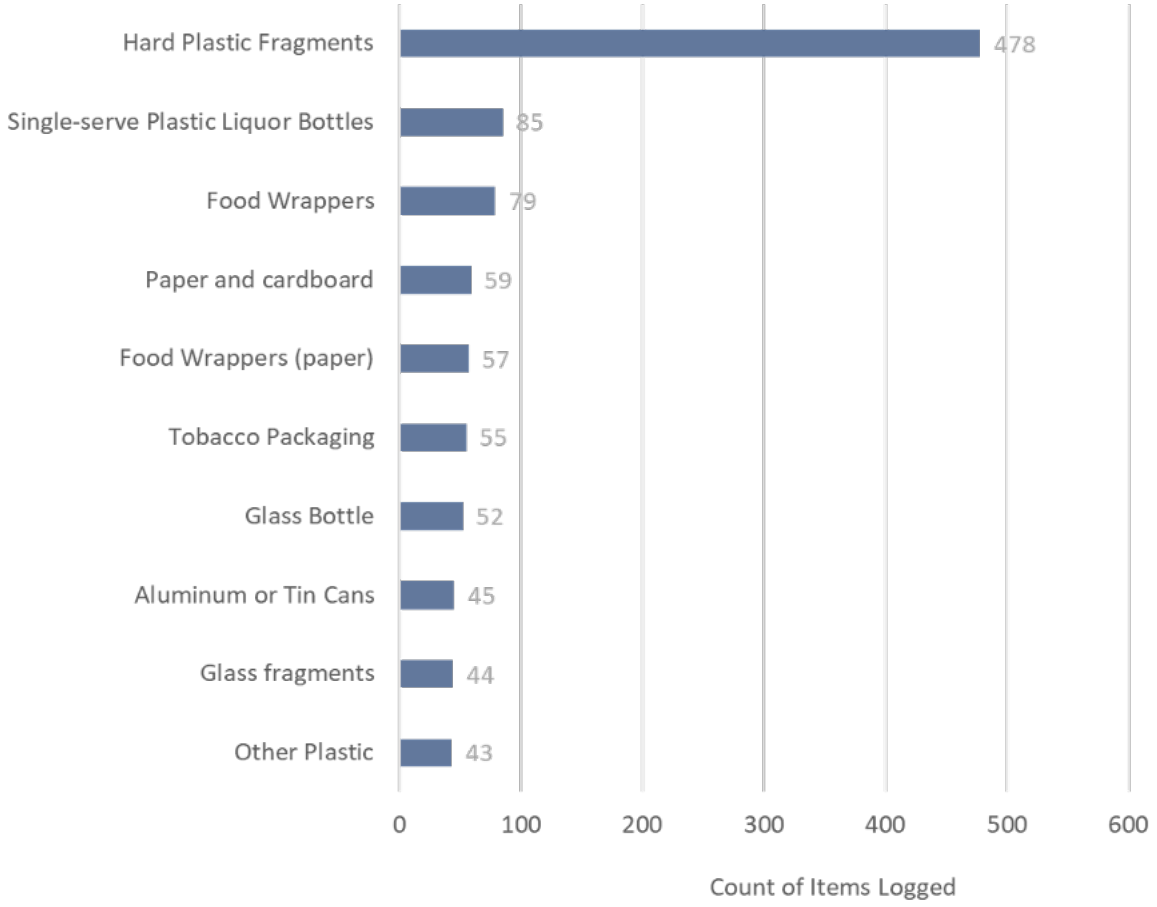


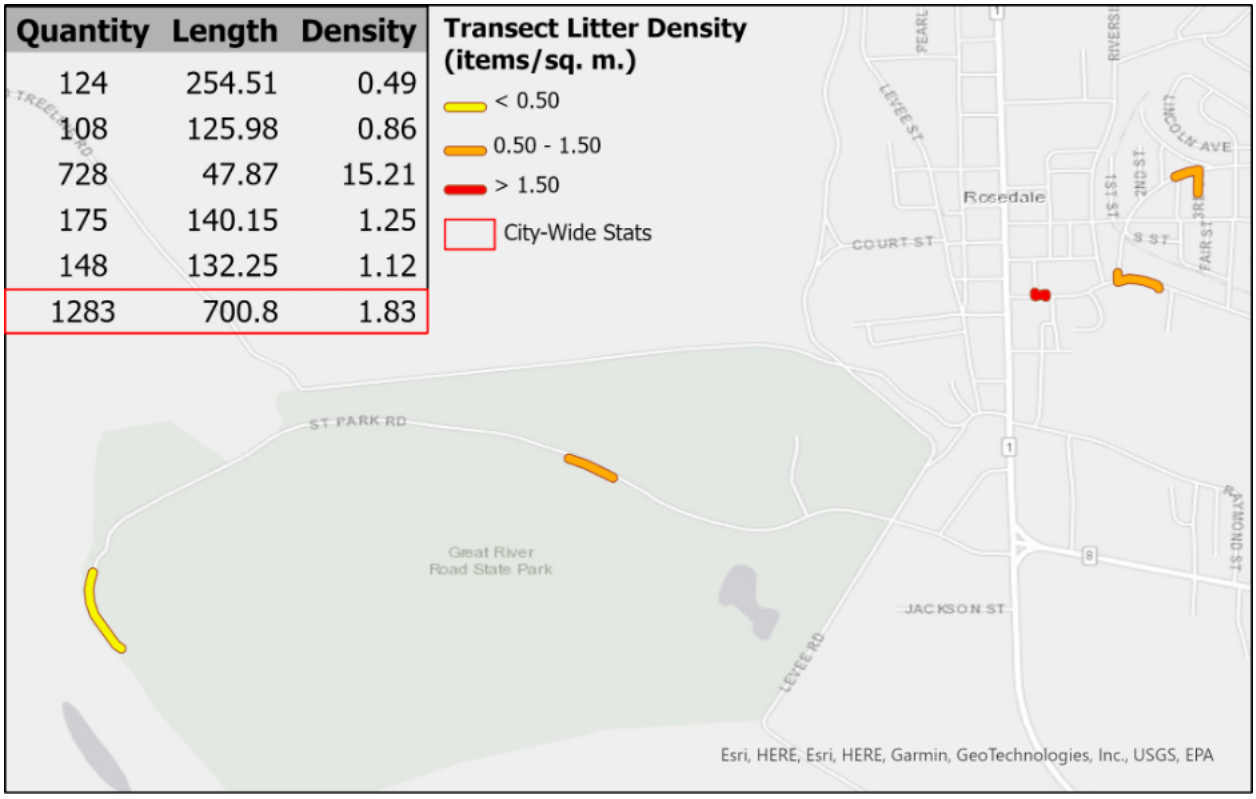
Figure 13: Most common litter items (by count) logged in Rosedale, MS



Litter densities in Rosedale ranged from 0.49 items/m2 to 15.21 items/m2 and averaged 1.83 items/m2 (Figure 14). Average litter densities in other communities surveyed along the Mississippi River have ranged from 0.28 to 0.69, meaning Rosedale is the highest density of litter observed along the river. According to local partners, this is driven by a multitude of factors, but one particularly concentrated area near a group of convenience stores brings up the average. While the convenience stores themselves did not have particularly high densities, several vacant lots near the stores served as accumulation points of litter. With Rosedale being an underserved community, this means the community is also burdened beyond that with plastic pollution in their environment.

Figure 14: Litter densities in Rosedale, MS

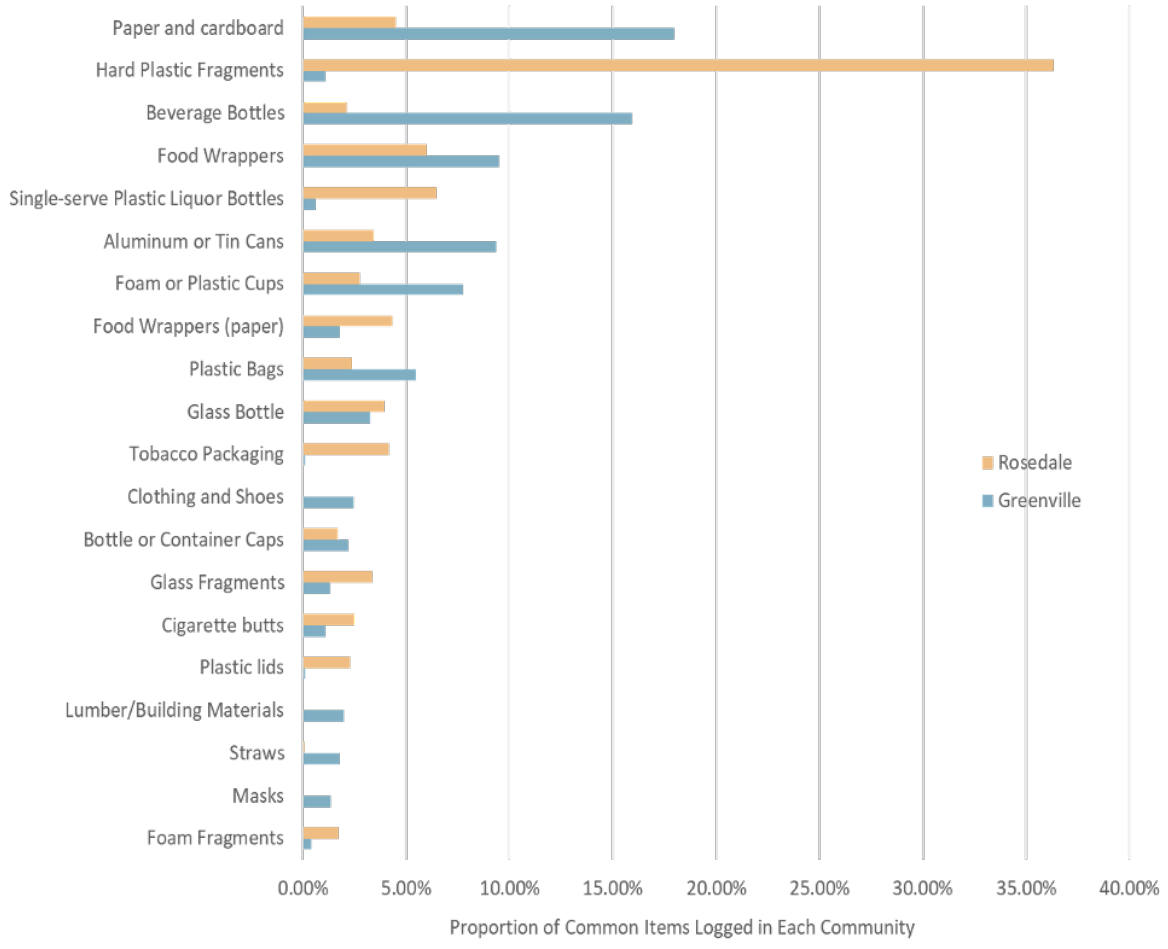
Quantity	Length	Density
124	254.51	0.49
108	125.98	0.86
728	47.87	15.21
175	140.15	1.25
148	132.25	1.12
1283	700.8	1.83



City Comparison

Rosedale and Greenville, MS had different litter profiles despite their geographic proximity. Notably, the fraction of hard plastic fragments was significantly higher in Rosedale than in Greenville, potentially suggesting that litter is staying in the environment longer and breaking down, rather than being picked up. Greenville's litter had a higher fraction of recyclable items, like aluminum or tin cans and plastic beverage bottles, which may suggest opportunities for targeted interventions. Greenville also had a much higher percentage of paper and cardboard, suggested by partners that may have been increased as cardboard recycling drop-off points ended in the past couple years. The higher prevalence of single-serve plastic liquor bottles in Rosedale suggests the need for further discussion with local partners to determine how best to meet the needs of the community.

Figure 15: Comparison of the proportion of common litter items (percent of abundance) out of all litter logged in Rosedale and Greenville, MS



Opportunities

After initial analysis of the data from each community, virtual meetings were held on August 29th and August 31st, 2022, to discuss the results with local partners, mayors, and other stakeholders. Opportunities identified by local stakeholders are provided below.

- Greenville previously had a robust cardboard and paper drop-off recycling program, but the program was discontinued due to price increases. Offering cardboard and paper recycling in Greenville may be of particular utility given the high levels of paper and cardboard found in the litter in Greenville.
- Greenville has a city-managed trash collection program with their own vehicle fleet that provides reliable service to residents. Residents have an action hotline they can call to report issues such as litter or illegal dumping. Greenville has demonstrated its capacity to build out successful, accountable waste management systems which could be leveraged into additional infrastructure development.
- Plastic and aluminum recycling bins are available at big box stores throughout Greenville. Greenville's litter had a higher fraction of recyclable items, like aluminum or tin cans and plastic beverage bottles, which may suggest opportunities for targeted interventions.
- Greenville has previously received funding to provide recycling education in schools. This work could be built upon to prevent recyclables entering the environment.
- Existing community partnerships and beautification efforts in Greenville could be expanded to further reduce litter.
- Rosedale contracts out trash pick up to a private company within the same country but it's not local. While this is more economically efficient for the city, there are challenges with inconsistencies of trash pick up and lack of local accountability and ownership by the contractor. These challenges with a private contractor may contribute to higher litter densities in Rosedale.
- Rosedale does not have access to any local recycling drop off locations. The nearest recycling drop-off is in Cleveland, MS about 20 miles away.
- High litter densities in concentrated areas in Rosedale exhibit a need for more and improved maintenance of receptacles to manage waste.
- The high litter densities in Rosedale highlight a need to further explore and for more resources to go to rural and impoverished communities in the US.
- Much of the litter was single-use plastic products, which could potentially be avoided through various alternatives. The question was posed, if there are external impacts to plastic use, is it really as convenient as we see it in our lives? This perspective may motivate initiating, expanding and improving reuse systems and making reuse more of a default behavior.
- Many options for alternatives to plastic already exist, such as paper, beeswax, and other natural materials.

Renewable and reusable alternatives need to be affordable and accessible to everyone, especially those in low-income and underserved communities where affordability is an issue.

- Expanded and enhanced local food systems could reduce the need for plastic packaging in some use cases.
- Stormwater catchment devices could help to trap unpreventable litter before it enters waterways.
- Connecting with common brands of litter items could give companies an opportunity to invest in marginalized communities in rural America.

Appendices

Appendix A — Methods

In order to get a "snapshot" of plastic pollution along the Mississippi River in the Delta cities of Greenville and Rosedale, MS, the following methods were employed and are further described in this section.

1. Development of the scientific strategy and surveying plan
2. Training of partners
3. Field work and data collection
4. Data Analysis

Development and Refinement of Scientific Strategy and Plan

The initial scientific strategy for data collection was developed from September 2020–February 2021 and was implemented in three pilot cities in April 2021[1] and then further refined for the Quad Cities in October 2021[2]. After completion of the first pilot phase of data collection, feedback on the strategy was obtained both through virtual sessions with partners and an online survey. Field methods were adapted based on the feedback from both the initial pilot work and the Quad cities work and published in an updated version of the Debris Tracker Citizen Science Field Guide.

The guide is a 13-page document that outlines the steps that community-members can take to join and participate in the initiative. The document contains step-by-step directions on how to contribute data to the project. These methods are further described here. Debris Tracker is the data collection tool that was used in each of the methods outlined below. The full list of litter items available to track is provided in Appendix B. The Debris Tracker interface is shown in Figure A1.

1. Youngblood, K, Finder, S. Jambeck JR. 2021. Mississippi River Plastic Pollution Initiative 2021 Science Report, Jambeck Research Group, University of Georgia, Athens, GA, USA
2. Youngblood, K, Finder, S. Jambeck JR. 2021. Mississippi River Plastic Pollution Initiative: Quad Cities Science Report, Jambeck Research Group, University of Georgia, Athens, GA, USA

Figure A-1: Debris Tracker (free mobile app used for data collection) Interface

A survey was available at the end of each tracking session to obtain additional metadata on the survey, such as which method the user was employing, further information about land use, and if the litter being logged was picked up or not. For multiple choice questions, users could select all that applied. The survey contained the following questions:

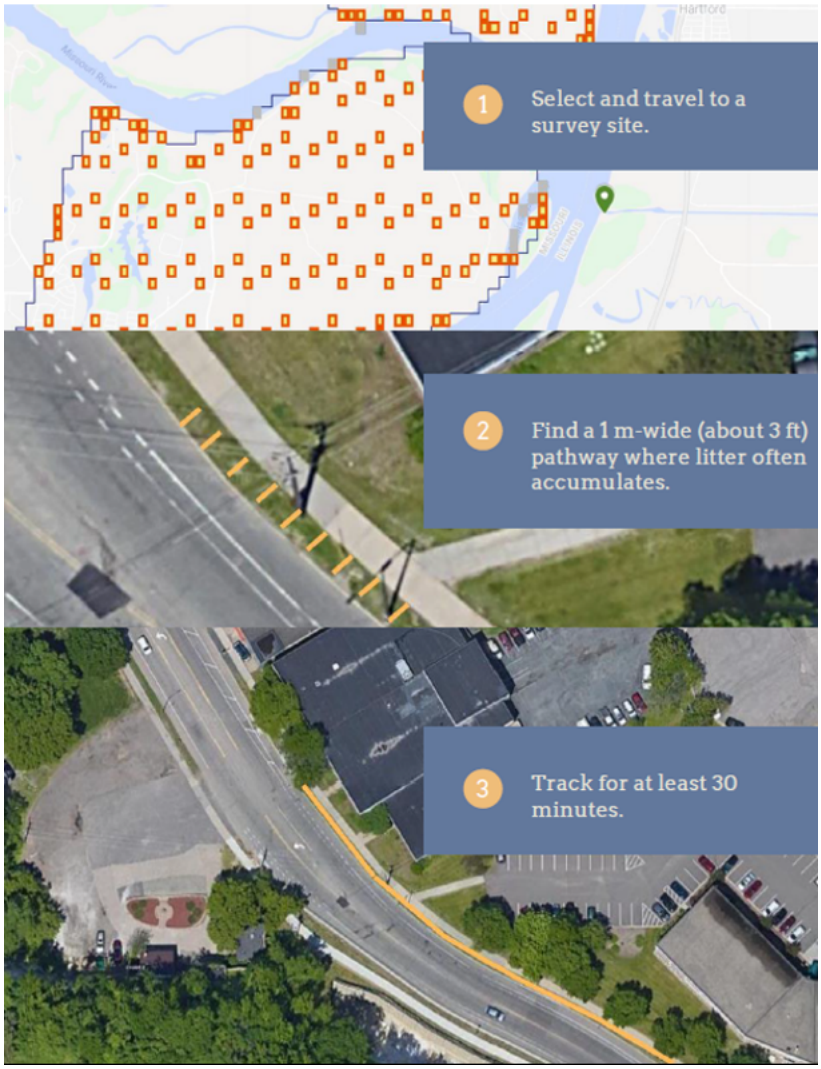
1. Were you sampling litter on land or floating debris in the river?
    - » On land
    - » In the river
2. Were you following the 1-m width transect sampling method?
    - » Yes
    - » No
3. Time spent tracking (min)
4. How many people helped collect this data INCLUDING yourself? (Note: do not include members of your group who are submitting data on other devices or did not track data.)
5. Did you pick up the litter you tracked
    - » Yes
    - » No
6. Which of the following land uses most applies to the general surrounding area?
    - » Residential (housing)
    - » Commercial (developed buildings)
    - » Mixed (housing and buildings)
    - » Industrial (such as warehouses)

   - » Green spaces (such as parks)
   - » Other
7. If recording land-based debris, where was your survey transect located?
   - » Along a sidewalk
   - » In a gutter
   - » Along a roadside
   - » Other
8. Any interesting litter items to note?
9. Any other observations to share?

Litter in Communities

Sampling areas in each of Rosedale and Greenville, MS were determined based on input from local partners and areas of interest in the community. Community members were provided Walmart gift cards for participation and Research Assistants in Greenville, Alana Mason, Brianna Bettis, and Elyssia Jones, as well as the Rosedale Freedom Project (RFP) were provided funding for their work specifically on this project. To provide a comprehensive look at what items are ending up on the ground from societal activities close to the source, and in order to capture active, upstream litter input, data collectors were asked to collect data in the identified urban areas (as opposed to just riverbanks). They were asked to select a 200 x 200 m (or about 650 x 650 ft) priority sampling area square on the maps provided. Once a data collector arrived at their selected area, they were asked to determine a safe public place to collect data along a roadside, sidewalk or other walkable area where litter often accumulates, e.g., a pathway on the side of a road, between a roadway and sidewalk or along a walkway in the park. If multiple pathways existed, the collector determined which to take. They were asked to follow the pathway generally; a pathway was not necessarily a straight line, i.e., if the path turns the person tracking should follow it (Figure A-2). The goal of the orange square starting points was to spread data collectors out to collect data all around the cities in a variety of locations.

Figure A-2: Quick start steps for collecting data in a transect



Training of Data Collectors

Training consisted of introductory meetings, two virtual webinars/training and in-person training for the RFP and the Greenville REsearch Assistants. The first webinar was given on June 7 and the second on June 8, 2022. The second webinar also featured Angelle Bradford speaking on Environmental Justice along with a partner discussion. The field guide and other resources were placed on the main project webpage at www.unep.org/Mississippi for anyone interested in the project to access. Webinars were recorded for those that could not attend.

- MS Delta Training Webinar 1 (June 7, 2022)
- MS Delta Training Webinar 2 feat. Environmental Justice (June 8, 2022)
- MS Delta Training in person in Rosedale with RFP: June 10, 2022
- MS Delta Training in person in Greenville with Research Assistants: June 10, 2022

Field Work and Data Collection

The primary field work of the initiative took place from June 11- July 17, 2022. This was the advertised time window for the project to the public and participating groups and partners. A public launch event to disseminate information about the project and to encourage data collection by the community was held on June 11, 2022. This event was held at 10am CST at Big Waters Cafe in Greenville, MS with breakfast provided before the press event and lunch provided after tracking. The event was held in collaboration with various partners and speakers included members of MRCTI, UGA, National Geographic, Rosedale Freedom Project, and the Mayor of Rosedale, Aelicia Thomas, and the Mayor of Greenville, Erick Simmons.

Data Analysis

Data analysis was conducted with Geographic Information Systems (GIS) including using ArcMap to determine the quantity and the characteristics of litter collected in the Quad Cities. Data was queried from the database in the two cities both the Mississippi River Plastic Pollution / MRCTI list on Debris Tracker from June 11 - July 14, 2022. To provide a snapshot of litter and plastic pollution along the Mississippi River, data analysis is being presented for both cities combined and for each individual city of Rosedale and Greenville, MS.

Appendix B — Mississippi River Plastic Pollution Initiative / MRCTI Debris Tracker List

Plastic
Food Wrappers
Beverage Bottles
Other Jugs or Containers
Bottle or Container Caps
Cigar Tips
Cigarette butts
Disposable cigarette lighters
Six-pack rings
Plastic Bags
Foam or Plastic Cups
Plastic lids
Plastic Utensils
Plastic take out containers
Foam take out containers
Straws
Balloons
Personal Care Products / Toiletries
Hard Plastic Fragments
Foam Fragments
Film Fragments
Fishing Gear
Tobacco Packaging
Needles or Syringes
Single-serve plastic liquor bottles
Plastic Balls or Toys
Other Plastic

Metal
Aluminum or Tin Cans
Aerosol cans
Metal Bottle Caps
Metal Fragments
Electronics
Household Appliances
Cylinders, Tanks, and Barrels
Other Metal

Glass
Glass Bottle
Glass Jars
Glass Fragments
Lightbulbs and Tubes
Other Glass

Rubber
Latex Balloons
Flip-flops
Rubber Gloves
Tires
Rubber Fragments
Other Rubber

Cloth
Clothing and Shoes
Fabric Pieces
Gloves (non-rubber)
Towels or rags
Rubber flip-flops
Mattresses
Carpet or Rugs
Other Cloth

Paper and Lumber
Paper Bags
Lumber/Building Materials
Food Wrappers (paper)
Paper and cardboard
Pallets
Stir sticks
Other Paper or Lumber

PPE
Masks
Disposable Gloves
Face shields / Goggles
Gowns
Empty bottles of hand sanitizer
Other PPE

Other Items
Other
Test Item

END OF DOCUMENT